United States
Department of
Agriculture

**Forest
Service**

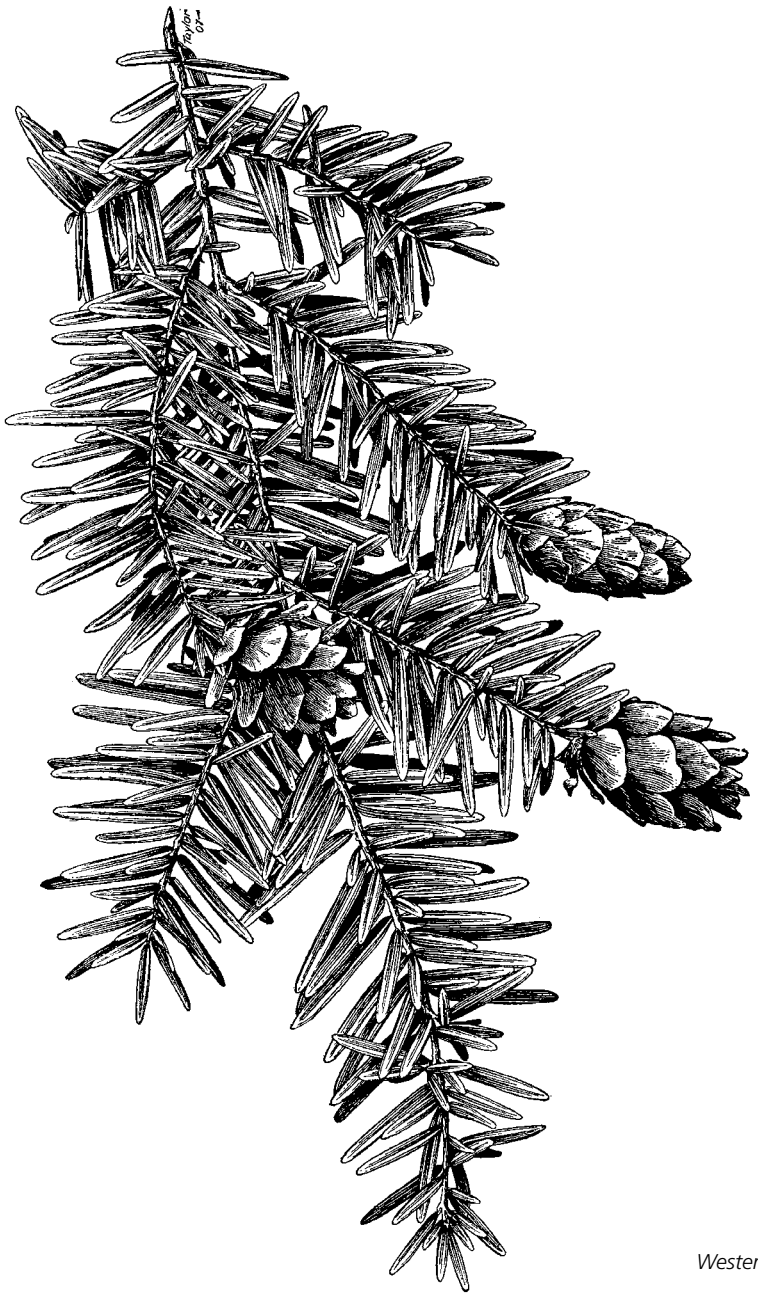
Pacific
Northwest
Region

2003

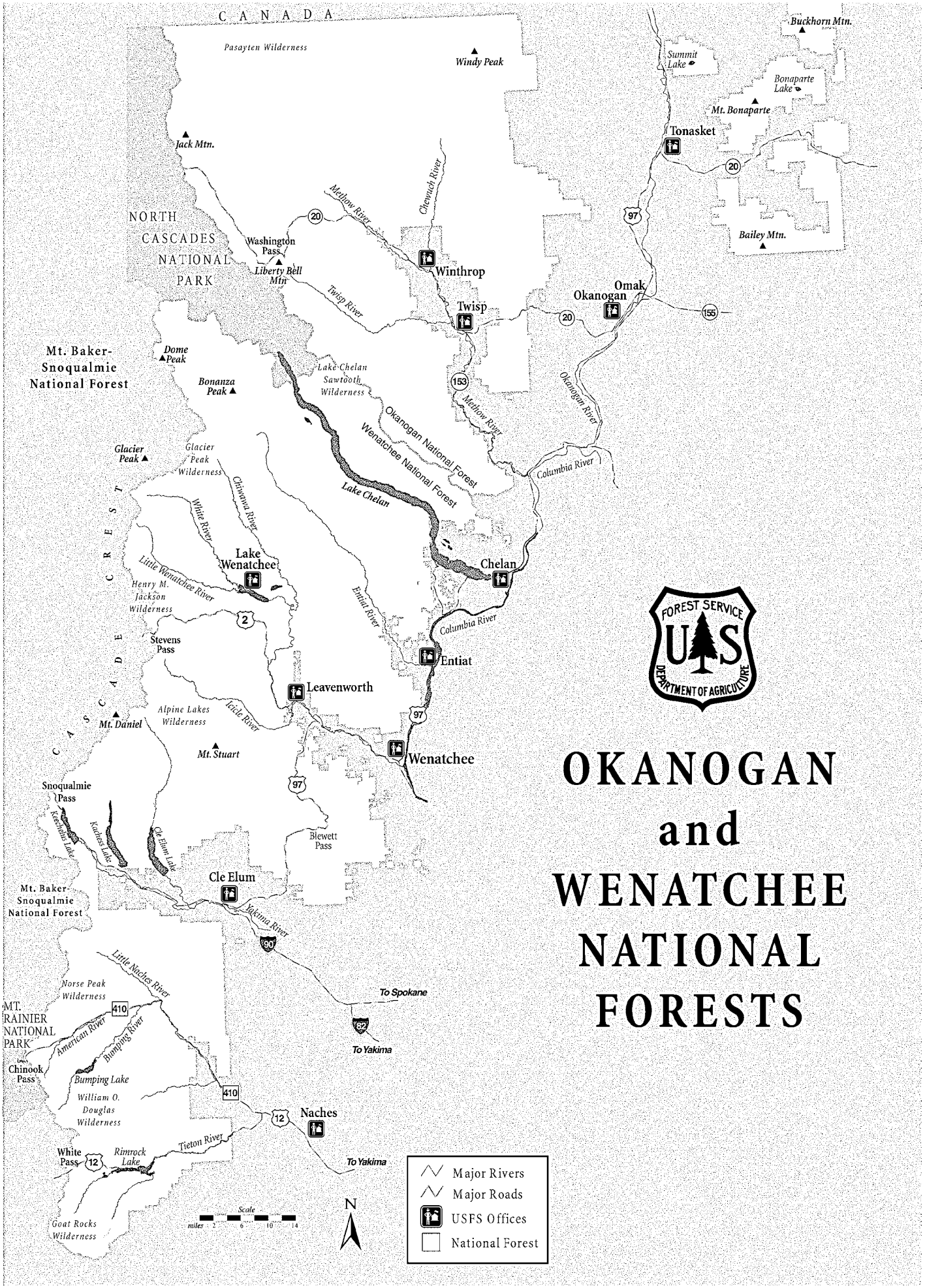
Monitoring Report

for the Land and Resource Management Plan

Wenatchee National Forest Fiscal Year 2002



Western Hemlock



OKANOGAN and WENATCHEE NATIONAL FORESTS

October 2003

Dear Forest User,

The *Wenatchee Forest Plan* establishes general direction of all resource management activities on the Forest. It provides for forest protection and coordinated multiple-use management of outdoor recreation, range, timber, watershed, wildlife and fish, minerals, and wilderness. The overall purpose is protection of ecosystem resources and providing for the sustained production of goods and services for the benefit of the American people.

Monitoring is a key part of *Forest Plan* implementation. This report summarizes and highlights Forest Service monitoring activities for Fiscal Year 2002 (October 1, 2001 through September 30, 2002). This is our eleventh Forest Plan Monitoring Report and it includes a summary of what has been learned from the last five years of monitoring in each resource area.

As Okanogan and Wenatchee National Forests Supervisor, I am responsible for ensuring that all Forest management activities comply with the *Forest Plan* Standards and Guidelines and Management Area Prescriptions. The monitoring and evaluation program tells us how we are doing in implementing the promises made in the *Forest Plan*. To keep you informed, I have prepared the annual Monitoring Report describing progress made in implementing the *Forest Plan* as reflected by monitoring and evaluation.

The Wenatchee Forest Plan has been amended 23 times since its implementation in 1990 through the end of September 30, 2002. These amendments have kept the *Forest Plan* current and responsive to the changing needs of the American people. The *Plan* was substantially amended by the *Northwest Forest Plan* on April 13, 1994. Whenever the term "*Plan*" or "*Forest Plan*" is used in the Report, it refers to the *Wenatchee Forest Plan* and all amendments.

This year, the Monitoring Report can be accessed through the Internet on the Wenatchee National Forest's home page at **www.fs.fed.us/r6/wenatchee**. If you do not have access to the Internet and would like to receive a hard copy of the Monitoring Report, please call or write to the Okanogan and Wenatchee National Forests Headquarters and request a copy of the Wenatchee National Forest FY 2002 Forest Plan Monitoring Report.

Okanogan and Wenatchee National Forest
215 Melody Lane
Wenatchee, WA 98826
(509) 662-4335

If you have any questions, concerns or comments regarding the information in this report, please contact Susan Carter Craig, Ecosystem Coordinator, Wenatchee National Forest at (509) 662-4335.

I hope you will continue to be involved with the management of National Forests.

Sincerely,
Darrel Kenops
Forest Supervisor

Monitoring Report
for the Land and Resource Management Plan

Wenatchee National Forest
Fiscal Year 2002

Contents

I. INTRODUCTION

PURPOSE OF THE MONITORING REPORT

The Wenatchee Forest Plan was implemented in 1990 after extensive analysis and public review and comment. The Forest Plan was amended in 1994 by the Record of Decision and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan). Preparation of the Forest Plan is required by the National Forest Management Act of 1976. It provides standards, guidelines, land allocations, and philosophies that serve as the basis for all Forest Service management on the 2.2 million acre Wenatchee National Forest.

The purpose of this annual report is to provide information to the Regional Forester, Forest Leadership Team, and the public on how well the Forest Plan Goals and Objectives are being met. The monitoring and evaluation process will provide information to determine if:

laws, regulations, and policies are being following, including those found in the *Forest Plan* Management Area Prescriptions, and Forest-wide Standards and Guidelines, the Regional Guide, and Forest Service Handbooks.

the management prescriptions are producing the predicted Goals and Objectives or Desired Future Conditions of the Forest environment.

cost and annual budgets of implementing the *Forest Plan* are within projected limits.

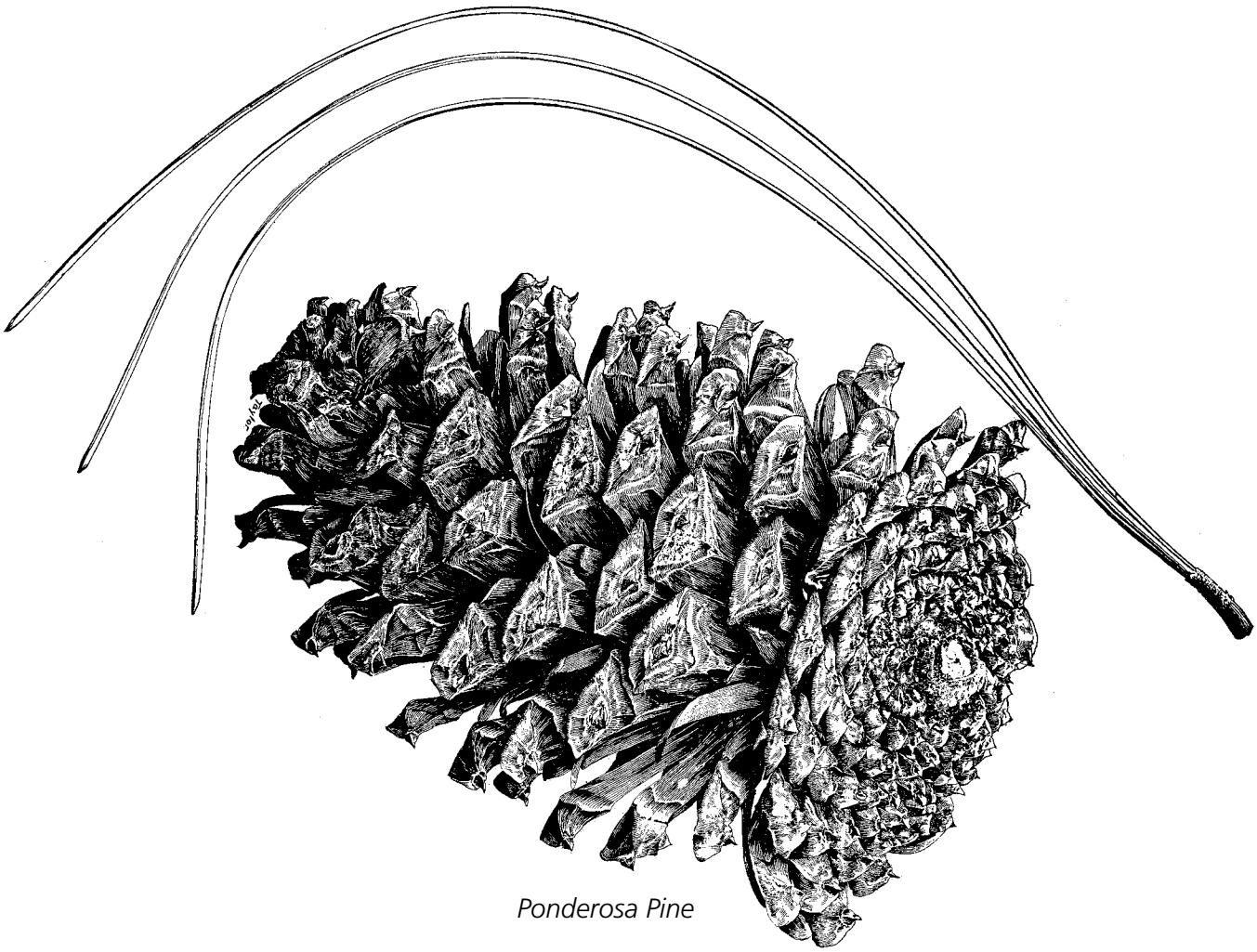
the projected range of outputs is being produced; it will also evaluate effects.

A number of monitoring systems are already in place to comply with administrative and legal responsibilities. *Forest Plan* monitoring does not replace these systems, but rather complements them by addressing specific issues and concerns identified through the planning process.

GENERAL INFORMATION

Monitoring consists of gathering data, making observations, and collecting and disclosing information. Monitoring is also the means to determine how well objectives of the *Forest Plan* are being met, and how appropriate the management Standards and Guidelines are for meeting the projected Forest outputs and protecting the environment. Monitoring is used to determine how well the assumptions used in development of the *Forest Plan* reflect actual conditions.

Monitoring and evaluation may lead to changes in practices or provide a basis for adjustments, amendments, or *Forest Plan* revisions. Monitoring is intended to keep the *Forest Plan* dynamic and responsive to change and new information.



Ponderosa Pine

II. SUMMARY OF THE RECOMMENDED ACTIONS

The following categories of actions are used to summarize those monitoring items needing attention from the Forest Supervisor and Forest Leadership Team. Group Leaders responsible for each monitoring item have recommended actions based on their evaluations.

Results are Acceptable/Continue to Monitor

The results for these monitoring questions are either acceptable (within the "Threshold of Variability" listed in Chapter V of the *Forest Plan*), or more than 1 or 2 years of data are needed to evaluate the results (continue to monitor). For some items, several years of data collection are necessary to evaluate the effectiveness or validity of the *Forest Plan*. Studies are being initiated to provide the baseline data and inventories necessary to answer these questions.

Change Management Practices

The results for these monitoring questions exceeded the "Threshold of Variability" for a particular monitoring item question in Chapter IV. An evaluation of the situation indicates the need to change practices to comply with the *Forest Plan*.

Further Evaluation/Determine Action

The results for these monitoring questions may or may not exceed the "Threshold of Variability". Additional information is needed to better identify the cause of the concern and to determine future actions.

Propose Forest Plan Amendment

Areas where results are inconsistent with the *Forest Plan* Objectives or the *Forest Plan* direction was not clear. The follow-up action requires either changing or clarifying the *Forest Plan* through the amendment process. The Forest Supervisor can make non-significant amendments; significant amendments require Regional Forester approval.

SUMMARY OF RECOMMENDATIONS TABLE

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
A. RECREATION					
Forest Trails	●				Continue monitoring as scheduled
Management of Developed Recreation	●				Continue monitoring as scheduled
Management of Dispersed Recreation Areas	●				Continue monitoring as scheduled
B. WILD and SCENIC RIVERS					
Wild , Scenic and Recreational Rivers	●				Continue monitoring as scheduled
C. SCENERY MANAGEMENT					
Scenic Resource Objectives	●				Continue monitoring as scheduled – see text for specific recommendations for watersheds.
Stand Character Goals	●				Continue monitoring as scheduled
D. WILDERNESS					
Recreation Impacts on Wilderness Resources	●				Continue monitoring as scheduled
E. CULTURAL RESOURCES					
Cultural and Historic Site Protection	●				Continue monitoring as scheduled
Cultural and Historic Site Rehabilitation	●				Continue monitoring as scheduled
F. COOPERATION OF FOREST PROGRAMS WITH INDIAN TRIBES					
American Indians and their Culture	●				Continue monitoring as scheduled
Coordination and Communication of Forest Programs with Indian Tribes	●				Continue monitoring as scheduled
G. SENSITIVE PLANTS, BIODIVERSITY AND OLD GROWTH					
Maintenance of Sensitive Plant Populations	●	●			Continue to address and evaluate the effects of proposed actions on sensitive plants. Establish quantitative formal monitoring as needed to protect sensitive plants and to ascertain the effects of natural and management activities on these species
Biodiversity and Old Growth			●		Continue to address biodiversity, either directly, or through its critical components in NEPA documents and watershed assessments.

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
Survey and Manage		●	●		Integrate assessments of Survey and Manage species into activities as directed by the NWFP. Continue to increase use of native plants for restoration and rehabilitation and monitor fire effects as needed.
Old Growth Ecosystems	●				Continue to follow old growth acres harvested and address in NEPA documents, where applicable
H. WILDLIFE					
Primary Cavity Excavators	●				Re-sample within the fire and salvage logging study area during 2004 and 2005 to monitor snag attrition and the response of primary cavity excavators. Survey snags before and after timber harvest to determine if snag standards are being met.
Land Birds	●				Complete post-prescribed fire monitoring of landbirds in the Pendleton Monitoring Study. Complete post-treatment monitoring of landbirds in the FFS Study. Publish results of short-term response of landbirds to the Pendleton Dry Site treatments and integrate findings into future restoration project designs.
Riparian Dependent Wildlife Species	●		●		Use data from the riparian amphibian monitoring as a pilot study to determine the statistical power of determining trends in amphibian populations under the current study design. Make adjustments to the monitoring effort according to the results of this analysis. Integrate the results of the riparian bird study into Forest Plan monitoring once they are available.

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
Deer, Elk and Mountain Goat Habitat			●	●	Coordinate with the WDFW to obtain population monitoring data that can be integrated into this report for deer, elk, and mountain goats. Revise and refine the elk and deer habitat effectiveness models based on the results of the elk habitat assessment and mule deer study. Integrate these models through Forest Plan revision and use the models in project level evaluations.
Northern Spotted Owl	●				Monitoring should include tracking the changes in the availability of suitable spotted owl habitat over time. Baseline habitat conditions were established in the Wenatchee National Forest Late-successional Reserve Assessment in 1997 (USFS 1997). This information was updated in 2002 and should be revisited in 2007 to track habitat trends. Continue to monitor >50% of the known spotted owl sites on the Forest in order to track trends in the number of young/site over time. Validate monitoring suitable spotted owl habitat and spotted owl productivity (young/site) to determine trends in the spotted owl population on the Forest. Cooperate with the Wenatchee Forestry Sciences lab to monitor how dry site restoration projects are influencing resource selection by spotted and barred owls during 2003-2006.
Bald Eagle	●				Continue to monitor nests and document the number of young produced.
Peregrine Falcon	●				Continue to monitor nests and document the number of young produced. Continue to monitor potential and active nest sites. Prepare site management plans for known nest sites.

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
Grizzly Bear	●				Continue to update the core area GIS layer as projects are implemented and better information becomes available. Continue to implement the Sanitation Policy by making human garbage inaccessible to bears in our campgrounds and recreation sites. Continue to report and follow up on grizzly bear observations in order to gather sufficient information to determine the validity of the report.
Gray Wolf	●				Track road densities in GIS to monitor habitat effectiveness for wolves. Cooperate on the development of a recovery plan or conservation strategy for the North Cascades. Continue to follow up and evaluate wolf reports and track these in a database.
Marbled Murrelet	●				Continue to monitor projects within the range of the species.
Canada Lynx	●				Continue to monitor projects within the range of the species.
Survey and Manage Species	●				Continue surveys of projects for survey and manage mollusk species. Monitoring the effectiveness of the mollusk management protocols where they occur in the dry forests.
I. TIMBER OFFERED, HARVESTED, and RELATED SILVICULTURAL ACTIVITIES					
Timber Offered (ASQ) and Timber Sale Program Quantity (TSPQ)	●			●	Continue to sell timber as directed in the Forest Plan. Continue to monitor PSQ utilizing the STARS and PSS databases and compare volume to projected decade trend.
Timber Harvest Units (size, shape, location)	●				Continue monitoring as scheduled
Timber Harvest	●				Continue monitoring as scheduled
Silvicultural Practices	●				Continue monitoring as scheduled

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
Reforestation	●				Utilize 1-1 bareroot or plug-1 stock with large roots to help increase survivability. Do not use 1-0 stock on dry lower elevation ecosystems. Continue monitoring as scheduled.
Lands not Suitable for Timber Management	●				Continue to utilize the NEPA process to determine suitability of lands. Continue to update the Wenatchee National Forest GIS layer that keeps track of suitability. Continue to monitor the reforestation success on all lands that are harvested or deforested by wildfire, especially on the drier, low elevation sites that tend to have more difficulty regenerating.
J. SOIL, WATER, FISHERIES and RELATED WATERSHED MANAGEMENT					
Maintenance of Long-Term Soil Productivity	●	●			Continue existing monitoring and incorporate measures listed in this section into project analyses
Riparian Standards and Guidelines	●		●		Continue existing monitoring program
Long-term Trends in Watershed Condition	●		●		Continue to operate instruments to create a long-term monitoring record.
Fish Management Indicator Species (MIS) Populations	●		●		Continue existing monitoring program
Aquatic Habitat Objectives	●		●		South Fork Tieton / Minnie Meadows data indicates a need for further monitoring to determine whether a problem exists, its nature and cause. In 2003 the existing sediment sampling in South Fork Tieton, will continue and be augmented it with aerial photo and ground reconnaissance to explore possible causes. The Forest will add sediment monitoring in Williams drainage to monitor effects of a 2003 culvert replacement and to establish pre-mine sediment levels for proposed mine projects. Campsite stewards will water riparian plantings in summer 2003 as well as making user contacts. These campsites stewards have already been enlisted.

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
Aquatic Ecosystems	●		●		Continue existing monitoring program
K. RANGE MANAGEMENT AND RELATED ACTIVITIES					
Forage Utilization					Not addressed this year
L. ROAD MANAGEMENT					
Road Construction / Reconstruction				●	Monitoring indicates management direction is not being achieved according to the original projections in the Forest Plan. Revise estimates during Forest Plan revision. Continue monitoring as scheduled.
Roads Maintenance			●		Continue Roads Analysis as outlined in the new Road Management Policy to determine the appropriate size and makeup of our existing road transportation system. Reduce maintenance levels and decommission those roads no longer necessary where appropriate. Continue monitoring as scheduled.
Roads Closed or Obliterated			●		Further evaluation; additional yearly information is needed. Due to the uncertainty about the future, it would be premature to make new assumptions for the purposes of estimating outputs until the Forest Plan is revised.
M. INSECT and DISEASE					
Insect and Disease Control	●				Incorporate options for achieving management objectives as identified in the "Strategy for management of dry forest vegetation on the Wenatchee National Forest."
N. FOREST FIRE PROTECTION					
Forest Fire Protection	●				Continue to monitor the effectiveness of the fire protection and prevention programs.
Use of Prescribed Fire	●				Continue to support on-going research supporting fire as an important disturbance process in all dry site ecosystems. Manage wildland fires within designated wildernesses for resource benefit.

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
O. AIR RESOURCE MANAGEMENT					
Long-Term Trends In Air Quality	●				Operate instruments on a year-long basis. Efforts are ongoing to evaluate data and make comparisons to air quality standards. Continue to use data from these monitoring sites as the Forest Service evaluates any new permits for emission sources that could potentially affect Class 1 wilderness areas.
P. MINERALS					
Mine Site Reclamation	●				The major problem with appropriate monitoring is not the process, but the available funding and staff. Continue to request funding that would allow 100 percent monitoring of all bonded mineral related activities, as has been the case over the last several years. If additional funding is provided, conduct additional monitoring to ensure adequate reclamation is being completed on non-bonded operations. Where it is not being properly completed, take regulatory action to require the operator to do the required
Mine Operating Plans	●				The objectives and Standards and Guidelines in the Forest Plan appear adequate, but the level of funding is inadequate to ensure total compliance. If determined to be desirable, request adequate funding that will allow monitoring of all mineral related activities. Based upon the administration and monitoring completed, a Forest Plan adjustment is not necessary at this time. Actively conduct programmatic resource surveys that will accommodate anticipated mineral activities. This will allow the processing of Plans of Operation in a more timely and efficient manner.
Q. COMMUNITY EFFECTS					
Community Effects					Dropped in 2001
Resource Budgets					Dropped in 2001

	Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
R. GENERAL MONITORING of STANDARDS and GUIDELINES	●				Support the regional interagency effort in developing effectiveness monitoring protocols that will lead to answering the question; are implemented Standards and Guidelines achieving the expected results? Consider restructuring the methodology of selecting project to monitor.
S. LANDS					Report for informational purposes only

A. RECREATION

Monitoring Item-

RECREATION OPPORTUNITY SPECTRUM (ROS)

The goal is to provide a well-balanced array of recreation opportunities across the breadth of the Recreation Opportunity Spectrum (ROS) to meet the public demand for outdoor recreation. The monitoring question is:

Are Forest management activities resulting in changes in ROS settings; and, do end results meet the experience levels expected in the Forest Plan?

The activities that have the potential to affect the ROS setting on the Forest are those activities that change the development level through roads or development of additional facilities. The Forest recreation program has been focused on reconstruction and rehabilitation of existing facilities. This maintains the current ROS class rather than changing it.

The other possible change to ROS class is the roading of unroaded areas for powerline corridors, mineral development, and timber sales. During the past year there were no known changes for these reasons.

Recommendations

Continue monitoring as scheduled.

Monitoring Item-

FOREST TRAILS

The goal is to manage trail use to provide recreation opportunities in a wide range of recreation settings, and in harmony with other resource management objectives. The monitoring questions are:

Are trails providing the variety of opportunities intended in the Forest Plan?

Are trails with mixed users (e.g. horse/hiker, hiker/ORV) meeting the expectations for all intended users?

The trails of the Wenatchee National Forest are providing the variety of opportunities as intended in the *Forest Plan*.

Trail conflicts between users remain at fairly low levels. The visitor surveys conducted in 2001 did not receive any comments regarding trail conflicts between users. Very few comments have been received or noted by field rangers in 2002.

Over the past five years, trail recreational trail use has become fairly controversial because of potential effects on wildlife species. Examples are hiker impacts to grizzly bears, snowmobile impacts on lynx habitat, and cross-country skier impacts on deer and elk winter range. As part of the Goose-Maverick lawsuit, the Forest has undertaken a study of trail recreation on wildlife habitats. The complete report, *Assessing the Cumulative effects of Linear Recreation Routes on Wildlife Habitats on the Okanogan and Wenatchee National Forests,* prepared by William Gaines, Peter Singleton and Roger Ross is available on the Wenatchee National Forest website:

www.fs.fed.us/r6/wenatchee/recreate/rec-wildlife-effects-3-20-03.pdf

In addition, the Forest is initiating another study to look at the distribution and timing of recreation use across the entire forest. This study is using the National Visitor Use Monitoring data to model recreation use. Additional information on this study is available at:
www.fs.fed.us/r6/wenatchee/recreate/rec-use-model.pdf

Recommendations

Continue monitoring as scheduled.

Monitoring Item-

MANAGEMENT OF DEVELOPED RECREATION FACILITIES

The goal is to provide safe, well-maintained, developed recreation facilities for the public commensurate with recreation demand. The monitoring questions are:

Are available developed recreation facilities meeting public demand?

Are developed recreation sites, areas, and facilities being adequately maintained to serve the public and protect resource values?

Visitor use at developed recreation sites continues at high levels. Most sites were at, or close to, capacity on most summer weekends. There are campground sites available during midweek, and early and late season. The Forest is currently meeting public demand for developed recreation facilities.

The Forest Service Capital Investment Program for new construction, or reconstruction of existing recreation facilities such as campgrounds and trails, continues to decline. The campground concessionaire program has reduced maintenance costs, since the concessionaire now performs routine maintenance. Campgrounds that did not generate sufficient revenue to interest concessionaires have now been placed under the Recreation Fee Demo program. This strategy has provided supplemental funds to the ranger districts that in turn, have allowed maintenance to increase at these campgrounds. However, most of these campgrounds are higher maintenance cost facilities than the concessionaire operated sites.

Recommendations

Continue monitoring as scheduled.

Monitoring Item-

MANAGEMENT OF DISPERSED RECREATION AREAS

The goal is to provide opportunities for dispersed recreation activities where compatible with other resource management objectives. The monitoring questions are:

Are dispersed sites meeting public demand?

Is the Recreation Opportunity Spectrum providing the expected variety for Forest users?

Dispersed camping is defined as camping in sites outside of developed campgrounds and that are accessible by vehicle. The visitor use survey showed that 5.9 percent of visitors participated in dispersed camping, while for 3.0 percent of visitors it was the primary purpose

for visiting the Wenatchee National Forest. These numbers are about one-third of the use in our developed campgrounds.

The highest demand is for camping spots adjacent to streams and lakes accessible by roads. The increase in both camping and trail use in riparian areas remains a concern. In several areas, the Wenatchee National Forest has controlled vehicle access, provided toilets, and provided parking to minimize the impacts of recreation use on the riparian resource. These areas have been very successful where the sites were designed using an interdisciplinary team composed of fisheries biologists, recreation planners, engineers, archeologists and landscape architects. These sites have met the needs of recreational users while protecting the riparian resources. The Forest has received recognition from the Regional Office for this innovative program which is called *Respect the River*.

Recommendations

Continue monitoring as scheduled.

B. WILD, SCENIC, AND RECREATIONAL RIVERS

Monitoring Item-

WILD, SCENIC, AND RECREATIONAL RIVERS

The goal is to retain the character and attributes of rivers recommended for Wild, Scenic, or Recreational designation. The monitoring question is:

Are resource management activities along recommended river corridors being conducted in a manner to provide protection at the appropriate level of classification?

There were no projects implemented on the Wenatchee National Forest that had the potential to affect the classification determined in the *Forest Plan* for recommended rivers.

Recommendations

Continue monitoring as scheduled.

C. Scenery Management

Monitoring Item –

SCENIC RESOURCE OBJECTIVES

The objective is to manage vegetation and facilities that provide views, which are consistent with the stated scenic quality objectives for each management area. The monitoring question is:

Do the cumulative effects of all resource activities within a viewshed meet the desired scenic condition?

Wenatchee National Forest (NF) landscape architects reviewed projects on Ranger Districts (RD's) to assess the potential cumulative effects of resource activities on scenery. Field review of project areas was done along three major viewsheds: Blewett Pass Highway 97, White Pass Highway 12, and Shady Pass viewsheds were selected for summary analysis in past years. Scenic resource analyses on these viewsheds indicate that the viewsheds vary from natural appearing to an altered condition. There were no new projects implemented over the last year in Blewett Pass Highway 97 and Shady Pass viewsheds. Monitoring will continue on these viewsheds as future projects develop.

White Pass viewshed is in a natural to slightly altered condition throughout the travel route. Vegetation changes throughout the travel route blend well with the natural diversity of landscapes from the Wenatchee National Forest boundary to White Pass. The scenic qualities of this viewshed are maintained at a very high level. Numerous maintenance projects were done in the developed sites over the last year. Horseshoe Cove picnic area was improved with addition of a new interpretive information site. New restrooms were added at Horseshoe Cover, White Pass Horse Camp, and Clear Lake Campgrounds. Windy Point Campground added new bollards for traffic controls and a Cascadian Architectural Style restroom was installed at the airstrip on the peninsula at Rimrock Lake. Vegetation restoration projects are underway along the viewsheds. Review of the Kaboom Project in the peninsula area to reduce fuels and improve the sustainability of the forest does maintain and enhance scenic quality by providing views in a variety of textural compositions in the landscape.

Projects Monitored in Other Viewsheds

Crow restoration project in Mission Creek on the Leavenworth RD and the Fish Pole Restoration project along State Highway 207 on the Lake Wenatchee/Leavenworth RD were monitored. The goal is to integrate the design arts into the proposed thinning and restoration projects to provide a variety of stand densities, and to have a natural appearing landscape character of large and small tree characteristics that is more sustainable and have high to moderately high scenic integrity. In both projects, landscape character described for the area and implementation of the project successfully achieved moderately high to high scenic integrity.

The 25-mile heli base along the foreground of the lower Forest Road No. 5900 above the Twenty Five Mile Creek State Park was monitored. Scenic quality for the project was not integrated into the project. The goal of the project was to provide two helipads along a rolling hillside. The project removed and rearranged landforms to accommodate for the safety and welfare for the heli base. Some blending of the slopes was done, but the design and overall appearance is an altered landscape character as viewed from Forest Road No. 5900. Color contrast of the disturbed light soil color is visible from the surrounding area along the Lake Chelan basin. To soften the alteration, rehabilitation measures to reduce the soil color with permeon and landscaping with natives are a possible solution to improve scenic quality.

Future goals for the scenic travel viewsheds are to promote a more natural appearing vegetative pattern by varying tree densities, species composition, irregular spatial arrangement of trees, and emphasizing the existing large tree characteristics of the area. Promoting high scenic quality of the forest environment, reducing sign clutter, integrating design arts into the built environment, and providing information and use opportunities in the natural and cultural landscapes are goals to the forest visitors.

Scenic Areas of the 1994 Fire Restoration Projects

Two areas were monitored this year: Round Mountain and Icicle Ridge on the Leavenworth and Lake Wenatchee RD's. A sample monitoring of these areas show slow recovery. These areas were burned during the 1994 fire. The landscape character was changed from a forested landscape pattern to a range of severely to mosaic burned landscape. The large scale burned landscapes, fallen down snags, and areas without green forested trees are the main cause of the catastrophic appearing landscape in the foreground and middleground views in the severely burned areas. Brown and gray colored snags have turned mostly gray and silver throughout the area. Snags left from the past restoration projects add to the diversity of the existing burned landscape character, but the snags have fallen faster in the past year.

The mosaic pattern of the burn in the Icicle River area provides a variety of small openings, patches of silver snags, and green up of the new emerging forest intertwined with the existing forest. The landscape scenic setting provides a diverse ix of form, line, color and texture inherent in the existing landscape character of the Cascade Mountain Range. The appearance of the Round Mountain area provides diverse variety of textures and colors. Color contrast of silver and gray snags area still standing to provide a scenic variety contrast of color within a green forested landscape as viewed from U.S. Highway 2, State Highway 209, and State Park swimming area at Lake Wenatchee. Silver gray snags add scenic variety and interest and appear natural within the forested landscape character. The design arts were integrated with the sciences to blend snag densities and the burned landscapes with the landforms to create a more sustainable landscape.

Recommendations

Blewett Pass Highway 97 Viewshed

Continue working with the Department of Transportation and permittees to minimize signs and structures, and for roadside improvements.

Continue to monitor and enhance high scenic quality along the travel route.

White Pass Viewshed

Continue working with White Pass Ski Company to improve signs, landscaping, and color scheme.

Continue monitoring Highway 12 to maintain the highest possible scenic quality by designing all activities to retain natural appearing scenery.

Continue working with Washing State Department of Transportation toward functional and aesthetically pleasing structures, safety, and danger tree removal.

Vegetation changes and structures along the Highway 12 viewshed should continue to be monitored and enhanced to protect and improve scenic qualities.

Shady Pass Viewshed

Maintain and enhance scenic quality while reducing fuels and improving forest health throughout the viewshed.

Incorporate design arts into thinning projects to improve scenic quality.

Future vegetation management along the viewshed should be designed to meet moderate to high scenic objectives.

Varying stand densities, irregular spacing, clumping, and creating a variety of spaces (with contrasting variety and diversity of tree sizes) will enhance scenic quality.

Scenic Areas of the 1994 Fire Restoration Projects

Continue to monitor as scheduled.

Projects in Special Places and Areas of High Scenic Concern

Continue to monitor as scheduled.

Fiscal Year 2001 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item –

STAND CHARACTER GOALS

The objective is to manage vegetation so that the stand character (species and structural mix) is moving in the direction specified for each Scenic Quality Objective (SQO). The monitoring question is:

Are related Standards and Guidelines being implemented, and do they achieve stated goals and objectives, particularly scenic character goals?

The desired future condition for scenery is a multi-story stand composition, variety and diversity of large trees in groves, clumps, and/or scattered throughout the landscape. The high degree of naturalness is desirable. Fire restoration and thinning projects to reduce fuels and promote healthy ecosystems have been initiated. This helps achieve a long-term forested environment with a more natural appearing landscape with scattered groups, individual large trees, and varying densities of vegetation patterns and a more open stand. The trend of harvest practices in the last 5 years has been towards partial cutting and thinning, where trees are left to achieve scenic quality and other resource goals.

Another goal is to reduce the amount of contrast in the viewsheds. The trend is viewsheds recovering to more naturally appearing landscapes. In 2002, 4483 (Harvest and TSI) acres of vegetation were treated (see monitoring item – Silvicultural Practices). Most of the treated acres were partial cuttings and thinning to promote enhancement towards sustainable landscapes with large tree characteristics. An example of specific scenic goals to maintain and perpetuate large yellow bark ponderosa pines, Douglas-fir, and other species was monitored on the Frozen Fish project along State Highway 207 (Lake Wenatchee Ranger District), the Kaboom project in the Peninsula area of Rimrock Lake (Naches Ranger Distric)t and in Johnson Canyon along Reecer Creek (Cle Elum Ranger District). Thinning to reduce natural fuel loading enhanced the appearance and long-term health of the existing small black bark ponderosa pine and Douglas-fir towards large yellow bark ponderosa pine and large Douglas-firs.

Recommendations

Continue monitoring as schedules.

Last year's recommendation was to continue monitoring as scheduled, this was completed

D. WILDERNESS

Monitoring Item-

RECREATION IMPACTS ON WILDERNESS RESOURCES

The goal is to perpetuate wilderness character, natural ecological processes, and provide recreation opportunities appropriate in wilderness. The monitoring question is:

Is recreation visitor use or management resulting in changes in the physical, biological, or social settings that approach Limits of Acceptable Change (LAC) Standards specified in the Forest Plan?

The Rex Creek Fire of 2001 and the Deer Point Fire of 2002, both located along the north shore of Lake Chelan in and adjacent to the Lake Chelan-Sawtooth Wilderness, created the conditions for the potential spread of a Class A noxious weed, common crupina (crupina vulgaris), from its present range adjacent to the fire into the newly disturbed area of the fire. An environmental analysis is being prepared that will consider possible herbicide and mechanical treatment options for the 2004 field season. The fire area will continue to be monitored for expansion of that weed population. On-going handpulling of individual plants has been used for over a decade, and has been moderately successful to date in containing the spread along the most popular trails. However, the Rex Creek Fire has the potential to spread the plants over thousands of acres.

The Chelan Ranger District is completing an environmental document to make a decision on controlling the spread of common crupina, inside and outside the Wilderness.

Recommendations

Continue monitoring as scheduled.

Continue to work on application of Limits of Acceptable Change Standards for wilderness management.

E. Cultural Resources

Monitoring Item -

CULTURAL AND HISTORIC SITE PROTECTION

The goal is to protect heritage resources from vandalism, disturbance from project activities, and natural degradation. The monitoring questions are:

Are the National Register characteristics of un-evaluated and significant heritage resource properties being protected?

Are all reasonably locatable heritage resources being discovered during project area reconnaissance?

For FY 2002, a total of 99 separate consultations occurred in compliance with Section 106 of the National Historic Preservation Act and in accordance with the1997 Programmatic Agreement regarding cultural resource management on National Forests in the State of Washington (PMOA). Of the 99 consultations, 43 projects required Section 106 consultation with the Washington State Historic Preservation Officer (SHPO). Forty-six (46) were handled internally per the 1997 PMOA. The number of large projects requiring concurrence by the State Historic Preservation Officer (SHPO) declined while the number of consultations for small projects with limited potential to affect historic properties increased. Project planning acreage ranged from a high of 140,000 acres for a grazing allotment management plan on the Naches and Cle Elum Ranger Districts to less than one acre. Acreage inventoried for cultural resources varied from a high of 6000 acres for timber and salvage sales on the Naches and Cle Elum Ranger Districts to less than one acre for summer home improvements. A total of 7080 acres were systematically inventoried and 69 new cultural resource sites were documented. Most of the new sites were located during inventories for salvage-and timber sales, and for FERC relicensing. Of those sites, 60 were formally evaluated. This increase in the number of sites evaluated reflects increased emphasis in this area of the heritage support program. This brings the Forest's total number of cultural resources to around 1500. More than half of the projects requiring heritage support had little or no potential to affect cultural resources and included weed eradication, permit renewals, wetland restoration within existing stream-river systems, road decommissioning and easements, and thinning. Projects requiring inventory include prescribed burns, timber and salvage sales, allotment permit renewals, summer home improvements, burn area emergency rehabiliation for district fires, and recreation and facilities-related projects.

Site protection and heritage awareness was emphasized through 18 events that included site tours, talks, displays, newspaper articles, school and public presentations. A number of ranger district employees included heritage awareness in their own area-specific presentations and some focused exclusively on local history. Three sites were under site stewardship (Leavenworth Ski Hill, American Ski Bowl, and Red Top Lookout). Site stewards and site monitors contributed 100 hours to the program.

The public had an opportunity to participate in two *Passport in Time* (PIT) projects which emphasized cultural resource site conservation and preservation. Projects included artifact identification, inventory and cataloging, and documentation of the Copper City mining area. PIT volunteers, those who assisted with our site restoration and rehabilitation projects, and site stewards contributed 404 hours of service. This is a marked decrease over 2001 and can be attributed to a reduction in the heritage budget, a reduced heritage workforce and an increase in fire activity requiring support locally and nationally. Through internal workforce actions and volunteer contributions, no site intrusions were reported for FY 2002 because of site-and project monitoring efforts.

Monitoring Item -

CULTURAL AND HISTORICAL SITE REHABILITATION

The goal is to rehabilitate damaged sites eligible for inclusion on the National Register of Historic Places. The monitoring question is:

For sites eligible for inclusion in the National Register of Historic Places, is appropriate stabilization or rehabilitation of damage being completed?

The Wenatchee National Forest currently has seven individual memorandums of agreement and memorandums of understanding that provide strict guidelines for managing and rehabilitating National Register and National Register eligible sites on the

Forest. In addition, the Forest is a signatory on a Programmatic Agreement governing the management of Depression Era (CCC) Administrative Structures on National Forests in the States of Washington and Oregon. In FY 2002, these agreements provided guidance for the enhancement and/or rehabilitation of historic properties.

In 2002, recreation, engineering and facilities staff routinely consulted with Forest archaeologists regarding the maintenance or rehabilitation of Forest Service administrative sites, campground and trail shelters, and lookouts eligible for or listed on the National Register of Historic Places. Nine historic properties were enhanced, restored, or stabilized or rehabilitated. Activities included three roofing projects, two of which were made possible through an anonymous donor (Swauk and Taneum C.C.C.-era picnic shelters); reroofing of the 25 Mile Administrative Site; and rehabilitation of Oak Creek Cabin, the American Forks-, Soda Springs-, Pleasant Valley-, and Silver Falls- picnic shelters. The interior of the Salmon La Sac Guard Station (National Register Site) on the Cle Elum Ranger District was painted. A number of these projects were completed by supervised volunteers.

Monitoring Item -

AMERICAN INDICANS AND THEIR CULTURE

The monitoring questions are:

For those trust resources identified in treaties with American Indians, what are their conditions and trends?

Are sites of religious and cultural heritage adequately protected?

Do American Indians have access to, and use of Forest species, resources, and places important for cultural subsistence, or economic reasons, particularly those identified in treaties?

The Wenatchee National Forest is sensitive to American Indian concerns and issues regarding reserved rights on ceded lands. The Forest recognizes and honors the 1855 Treaty signed with the confederated tribes and bands of the Yakama Indian Nation. Article 3 of that treaty states:

> *The exclusive right of taking fish in all the streams, where running through or bordering said reservations, is further secured to said confederated tribes and bands of Indians, as also the right of taking fish at all usual and accustomed places, in common with the citizens of the territory, and of erecting temporary buildings for curing them; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed lands.*

The heritage program shares project information equally with the Yakama Nation (Treaty tribe) and the Colville Confederated Tribes (Executive Order tribe) through distribution of the Forest's Schedule of Proposed Actions (SOPA), Passport in Time newsletters, and on a case-by-case basis for all projects involving a decision notice or decision memo. Government-to-government consultation was a major emphasis of the FY 2002 program. Every effort is made to identify and protect Traditional Cultural Properties (TCP). Detailed ethnographic studies, which often include discussions of TCPs, sometimes accompany heritage resource survey reports when a need is indicated. Through our participation in FERC relicensing for the Lake Chelan and Rocky Reach dams, our heritage staff worked closely with representatives for the Yakama Nation and Colville Confederated Tribes.

F. COORDINATION AND COMMUNICATIONS OF FOREST PROGRAMS WITH INDIAN TRIBES

The goal is to coordinate with appropriate Tribal representatives for all projects in which Indians may have a concern. The monitoring questions are:

Are American Indian rights being protected on National Forest lands?

Are projects with activities or areas of concern to Indians being coordinated with appropriate Tribal representatives?

The Wenatchee National Forest recognizes that recognition of, and the honoring of, existing treaties and executive orders is crucial in government-to-government relations with the Yakama Nation, Confederated Colville Tribes and other interested tribes. Protection of American Indian treaty and religious freedom-rights are incorporated into Forest decision-making. Consultation with tribes that may have an interest in management activities is initiated at the earliest stage of project planning and is carried through to completion of the project. Each year contact is made with tribal councils to identify appropriate contacts for various projects. The Memorandum of Understanding between the Yakama Indian Nation and the Forest Service continues to guide anadromous fish habitat management. The Yakama Indian Nation continues to participate in Provincial Advisory Committee activities for both the Eastern Washington Cascades Province and the Yakima Province.

G. SENSITIVE PLANTS, BIODIVERSITY, AND OLD GROWTH

Monitoring Item –

MAINTENANCE OF SENSITIVE PLANT POPULATIONS

The goal is to provide appropriate habitat to maintain viable populations or enhance populations of all threatened, endangered, and sensitive plant species. The monitoring question is:

Are sensitive plant species populations being maintained or increasing?

There are over 50 sensitive plants listed for the Wenatchee National Forest. Many are known to occur while others are suspected. All have limited distribution and some are in fairly inaccessible areas. Of the species known to occur, two are federally listed as Endangered (Wenatchee Mountains Checker-mallow and Showy Stickseed) and five are Species of Concern. One additional species (Ute Ladies' tresses), may occur on the Forest, and is listed as threatened. The Regional Forester's Sensitive Species List was revised in Fiscal Year 1999 to better identify those plants for which serious threats to viability exist.

In order to maintain sensitive plants, all ground disturbing activities require biological evaluations; this allows the effects of activities on sensitive species to be determined and essentially monitored on a project by project basis. The requirement to complete biological evaluations helps assure that management activities do not result in loss of viability of sensitive plant species. Project surveys for sensitive plants were done on over 6,576 acres, and resulted in new sightings of Clustered Lady's slipper, and long-sepalled globemallow.

Plot techniques can also be used to intensively monitor sensitive plants. The primary criteria to determine which species are monitored include: (1) rarity of the plant, (2) threats, (3) accessibility, and (4) funding.

Sometimes a specific project will potentially result in some impact to sensitive species; this provides an opportunity for monitoring effects of that activity on the plant.

Generally then, intensive monitoring has focused on rarer plants and those that have significant threats. Consequently, plants that occur in areas where management activities commonly take place often receive more attention. Plants that grow in inaccessible areas may not be monitored due to lack of threats and the physical difficulty of reaching them. Funding is also an important consideration, for monitoring is an expensive endeavor. It is difficult to initiate or continue monitoring when funds are limited and not consistent from year to year.

The sensitive plants that have been monitored with plot techniques since 1990 include:

Wenatchee larkspur	Clustered lady's slipper
Chelan rockmat	Henderson's ricegrass
Thompson's clover	Smoky Mtn sedge
Showy stickseed	Botrychium species
Long-sepaled globemallow	Sierran cliffbrake
Pine broomrape	Seely's silene
Wenatchee Mt. checker-mallow	Blue showy stickseed

Three of these were monitored using plot techniques in FY 2002 including: Wenatchee Mountains checker-mallow (*Sidalcea oregana* var. *calva*), Seely's silene *(Silene seelyi),* and blue showy stickseed (*Hackelia taylori,* species novum). Informal monitoring was conducted on: long-sepaled globemallow (*Iliamna longisepala*), showy stickseed (*Chelan* rockmat *(Petrophyton cinerascens),* and Thompson's clover (*Trifolium thompsonii*). In addition, photo monitoring sites were established for tall agoseris (*Agoseris elata*) this fiscal year.

As noted above, some monitoring activities have used very formal plot techniques while others have been much more informal and anecdotal in nature. Most of the rarest plant species occur on the Leavenworth RD, and as a result, most formal monitoring has occurred on that Ranger District. However, all Ranger Districts completed either formal or informal monitoring of sensitive plants in FY 2002. None of the surveys or monitoring suggests that any T, E, S, or P species are declining.

A long-term investigation of *Sidalcea oregana* var. *calva* was continued. Six permanent plots across the entire range of the species were revisited and data were collected on a variety of ecological, biological, and morphological variables. These plots will be measured repeatedly over time to establish a baseline of information regarding this species. This information will be used to develop a species conservation strategy and recovery plan. Checker-mallow populatios appear stable while showy stickseed populations may be increasing.

Finally, all NEPA documents completed on the Forest addressed Sensitive plants where appropriate. Typically, the NEPA analyses used input from the required Biological Evaluations for plants.

Recommendations

Continue to address and evaluate the effects of proposed actions on sensitive plants. Establish quantitative formal monitoring as needed to protect sensitive plants and to ascertain the effects of natural and management activities on these species.

Monitoring Item –

BIODIVERSITY AND OLD GROWTH

The goal is to maintain native and desirable introduced or historic plant and animal species and communities. Provide all seral stages of all plant associations in a distribution and abundance to assure species diversity and viability. A desired future condition is to establish the local needs of management indicator species, rare species, and the proportion of seral stages that allows for natural diversity. The monitoring questions are:

Is the Forest ecosystem functioning as a productive and sustainable ecological unit?

Is the use of prescribed fire or fire suppression maintaining the natural processes of the Forest ecosystem?

Are desired habitat conditions for the northern spotted owl and the marbled murrelet maintained where adequate, and restored where inadequate? (See Wildlife Section)

Are habitat conditions for late-successional forest associated species maintained where adequate, and restored where inadequate?

Are desired habitat conditions for at-risk fish stocks maintained where adequate, and restored where inadequate? (See J. Soil. Water, Fisheries and Related Watershed Management)

Is a functional interacting, late-successional ecosystem maintained where adequate, and restored where inadequate?

Did silvicultural treatments benefit the creation and maintenance of late-successional conditions?

Will the overall conditions of the watersheds and provinces continue to be productive over the long-term?

Biodiversity

Biodiversity is essentially the variety of life and the processes that link them together and allow them to function; therefore, the amounts, kinds and distribution of listed, sensitive and survey and manage plants, old growth and noxious weeds all affect biological diversity. Monitoring of fire effects and recovery all relate to biological diversity as does the collection and use of native plant materials for restoration work.

A number of NEPA documents were completed in FY 2002. These documents often addressed biodiversity and/or the components including old growth (late-successional habitat), sensitive plants, and noxious weeds. Survey and Manage (S&M) species were also included in these analyses as directed by the Northwest Forest Plan. These attributes are critical components of biological diversity. Weeds affect biological diversity by excluding native plants. Old growth ecosystems, sensitive plants and survey and manage species are often limited in extent and as such can significantly impact biological diversity by changes in their extent.

Monitoring Item-

NOXIOUS WEEDS

Each Ranger District completed some control efforts, and a variety of surveys were done for noxious weeds. A major effort continued to determine the status of dalmation toadflax on the Forest. In an effort to become proactive in the battle with noxious weeds and to bring state-of-the-art vegetation management practices to the Forest, an Invasive Species Prevention Strategy was adopted in FY 2002. Weed surveys were completed on a total of 4,550 acres. Over 1,157 acres of weed control using a variety of methods were completed on the Forest.

Recommendations

Become more quantitative in evaluations of weed populations and implement the Forest Prevention Strategy.

Evaluate weed potential for all ground disturbing projects.

Monitoring Item-

SURVEY AND MANAGE PLANTS

Surveys have begun for a variety of Survey and Manage (S&M) species deemed important late-successional habitat components. These include vascular plants, fungi, lichens and bryophytes (*Northwest Forest Plan ROD, January 2001 Table 1-1*). On the Wenatchee National Forest, S&M plants are primarily a concern in areas with climates strongly affected by maritime air from the western side of the State. Consequently, Naches, Cle Elum, Lake Wenatchee and Leavenworth RDs have the highest likelihood of supporting S&M plant species.

Project areas must be evaluated for suitable S&M habitat. Those areas that support S&M habitat are being surveyed following Northwest *Forest Plan* direction. In FY 2002, over 5,350 acres of project-level surveys were completed for a plethora of S&M species.

Survey and Manage plants species found during FY 2002 surveys

Scientific Name	Common Name or Taxa Group, and (Status)
Cypripedium fasciculatum	clustered lady's-slipper (R6 and SM)
Buxbamia viridis	moss (SM)
Rhizomnium nudum	moss (SM)
Hypogymnia duplicata	lichen (SM)
Lobaria linita	lichen (SM)
Bryoria tortuosa	lichen (SM)
Gyromitra Montana	fungus (SM)

* Status: R6 = Regional Forester's Sensitive List; SM = Survey and Manage

Additionally, a variety of strategic and purposive surveys were completed (unrelated to project actions) in an attempt to ascertain the general abundance of S & M plant species. Most of the strategic surveys were regionally directed contracts with contract inspection provided by district personnel. Purposive surveys on over 350 acres were completed by district personnel.

Other Vegetation and Fire Monitoring

The Chelan RD monitoring of Burned Area Emergency Rehabilitation (BAER) measures for the North 25 Mile Fire continued as part of normal field activities. This monitoring included long-term vegetation transects, evaluation of the rehabilitation seeding, evaluation of channel and hillslope structures and long term photo-point establishment. Noxious weed response to prescribed fire was a focus of study on the Entiat RD. Riparian vegetation monitoring that began in 1994 also continued.

Recommendations

Continue to address biodiversity, either directly, or through its critical components in NEPA documents and Watershed Assessments.

Integrate assessments of Survey and Manage Species into activities as directed by the Northwest *Forest Plan*.

Continue to increase use of native plants for restoration and rehabilitation and monitor fire effects as needed.

Monitoring Item –

OLD GROWTH ECOSYSTEMS

See also the wildlife section for the discussion on old growth habitat and refer to the Timber Section for volume and acres harvested by method in FY 2002.

Is old growth acreage being retained at the expected rate?

In the *1990 Wenatchee Forest Plan*, there was estimated to be about 319,000 acres of old growth on the Forest. Most of this was in wilderness. At the end of the first decade it was predicted that 307,300 acres would remain. This came off of a suitable base acres of about 630,000. Under the *Northwest Forest Plan*, only about 209,000 acres are considered suitable. It is very unlikely that the 11,500 acres of old growth predicted for harvest in 1990 will actually be harvested in the near future. In fact, ingrowth will likely grow old growth faster than the harvest rate. This is particularly true when only about 35 percent of the original suitable acres is available for harvest. Probably the biggest threat to old growth forests at this time is catastrophic fire and, in fact, fire has led to the loss of old growth on most districts the past few years. At the low level of current harvest, it is certain that ingrowth contributed more acres to "old growth" than was removed through harvest.

Recommendations

Continue to follow old growth acres harvested and address in NEPA documents.

H. WILDLIFE

Monitoring Item-

MANAGEMENT INDICATOR SPECIES (MIS) HABITAT

Management Indicator Species are plant or animal species identified in the *Wenatchee National Forest Land and Resource Management Plan* whose population characteristics can be used to evaluate the effects of land and resource management practices on the habitats they use.

For the Wenatchee National Forest, these species include old growth dependent species (such as the spotted owl and American marten), primary cavity excavators (such as pileated woodpecker, northern three toed woodpecker, and others), ungulates (elk, mule deer and mountain goats), and riparian dependent species (such as the beaver, ruffed grouse, amphibians). A summary of the monitoring that has occurred for each of these species groups is provided in the following discussion.

The areas being maintained as Old Growth and Mature Forest (OG) Associated Species were changed when the *Forest Plan* was amended in 1994 by the *Northwest Forest Plan*. OG1 and OG2 areas were originally designations for pileated woodpeckers, marten and northern three-toed woodpeckers are no longer land allocations.

Monitoring Item-

PRIMARY CAVITY EXCAVATORS

The goal is to maintain viable populations of primary cavity excavators

Is primary cavity excavator habitat being managed in the proper amounts within land allocations?

Is habitat being used as expected?

Primary cavity excavators (PCEs) are considered to be keystone species within forested ecosystems because of the important ecosystem processes and functions they carry out. One of these functions includes the creation of cavities, which in turn provide habitat for a wide variety of other birds and mammals. To monitor primary cavity excavator populations and their habitat use, two large studies have been conducted. These include monitoring primary cavity excavators within stand replacement fires that occurred in 1994, and monitoring the effects of vegetation management on the retention levels of snag habitat. The study of primary cavity excavators within the burned areas was carried out in 1998 and 1999. Some of the results of this study are shown in the tables and figure below, and the conclusions are provided in the abstract that follows. More details of the study can be found in the paper that was published, which is available at the Forest Headquarters. This study was intended to monitor how primary cavity excavator populations responded to stand replacement fires and subsequent salvage logging. This study will be repeated (pending funding) during 2004 and 2005 to monitor the long term effects of fire and salvage logging on primary cavity excavators and their habitats.

Monitoring of Primary Cavity Excavator Populations

Number of active cavity nests of bird species in the treatments, WNF, 1998-1999 combined.

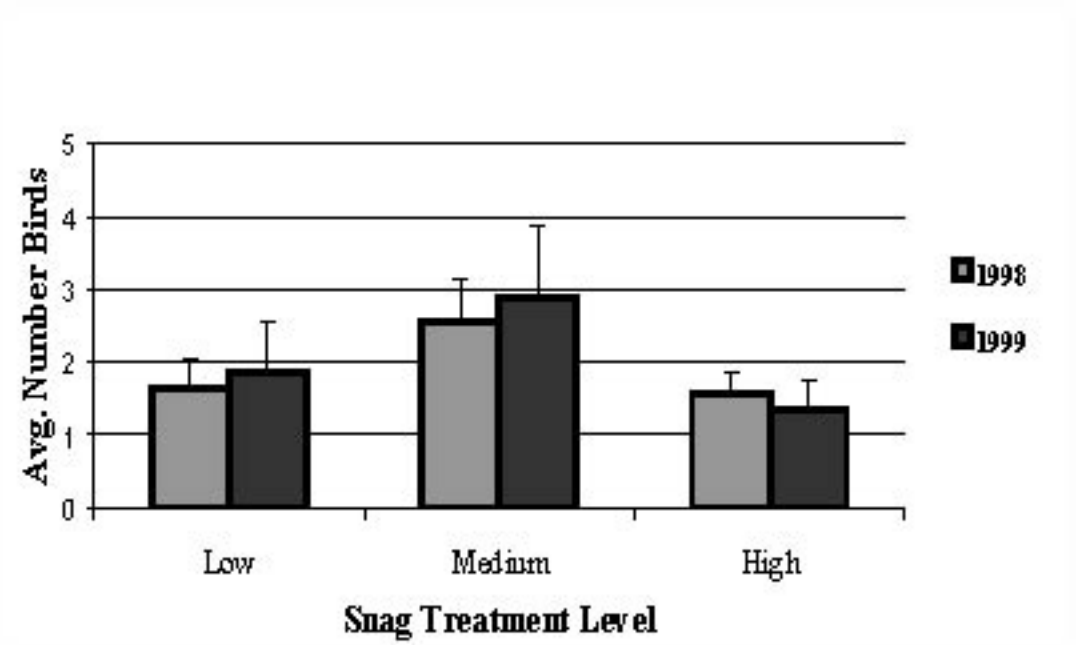
	Tree Density		
Species	**Low**	**Medium**	**High**
Northern flicker	4	12	6
Hairy woodpecker	3	6	6
Black-backed woodpecker	0	1	1
Lewis' woodpecker	10	4	0
Western bluebird	5	7	2
Mountain bluebird	7	12	5
House wren	0	12	7
American kestrel	1	2	1
TOTAL	**30**	**56**	**28**

The mean number of birds/point count station in each of the treatments, Wenatchee National Forest, (1998-1999 averaged).

Numbers in bold show significant differences (P = 0.05). P = primary cavity nester, S = secondary cavity nester.

Species	Low Density		Medium Density		High Density	
	LDS1	**LDS2**	**MDS1**	**MDS2**	**HDS1**	**HDS2**
White-headed woodpecker (Picoides albolarvatus) – P	0.09	0	0	0.17	0	0
Lewis' woodpecker (Melanerpes lewis) - P	1.84	1.59	0	1.42	0	0
Black-backed woodpecker (Picoides arcticus) - P	0	0	0.25	0.75	1.34	0.17
Hairy woodpecker (Picoides villosus) - P	0.75	2.09	2.50	2.50	3.09	3.83
Northern flicker (Colaptes auratus) - P	1.75	2.84	4.25	3.92	3.00	2.00
Western bluebird (Sialia mexicana) - S	1.57	1.92	0.75	1.50	0.67	0
Mountain bluebird (Sialia currucoides) – S	2.33	1.59	3.25	3.67	2.25	0.67
Red-breasted nuthatch (Sitta canadensis) – S	0.09	0.17	0.34	0.75	0.25	0
House wren (Troglodytes aedon) – S	0.92	1.50	2.00	1.92	1.25	0.42
European starling (Sturnus vulgaris) - S	0.09	0.92	0	4.17	0	0.17
American kestrel (Falco sparverius) - S	0.34	1.09	0.50	1.84	0	0.17
Brown preeper (Certhia americana)	0	0	0.09	0	0	1.25
Northern Pygmy owl (Glaucidium gnoma)	0	0	0	0	0	0.09

Mean number of cavity nesting birds in the three treatments areas: low, medium, and high snag density.



Haggard, M.E., and W.L. Gaines. 2001. Effects of Stand-Replacement Fire and Salvage Logging on a Cavity-Nesting Bird Community in Eastern Cascades, Washington.

Northwest Science 75(4):387-396.

Abstract:

The response of cavity-nesting bird species was monitored in three snag density treatments (high = 37-80 snags/ha, medium = 15-35 snags/ha, and low = 0-12 snags/ha) during two breeding seasons, 4-5 years post-fire and logging in Douglas-fir and ponderosa pine forests. Snag surveys were used to describe habitat, and both breeding bird surveys and nest surveys were used to characterize the bird community. Stands with the medium snag density treatment had the highest abundance, species richness, and nesting population of cavity nesters. The reasons for this may be: 1) snags were not evenly distributed within a stand such that both clumped and dispersed snag density habitat were interspersed in this treatment, and 2) a greater proportion of ponderosa pine snags in medium density treatments may have attracted species that prefer ponderosa pine for nesting and foraging. Ponderosa pine was preferred for nest sites and large snags (>48 cm dbh) provided nesting habitat for more species than smaller snags. However, smaller snags were used for nesting and foraging by some species.

Monitoring of Primary Cavity Excavator Habitats

The second primary cavity excavator monitoring study was initiated in 2001 and was designed to determine the direct, short-term effects of timber harvest and harvest systems on snag numbers. In addition, a secondary objective was to monitor the effectiveness of meeting Forest Plan snag standards. To date, the fates of 639 snags over 266 acres of dry forest restoration projects have been monitored. Additional monitoring is underway to determine how different harvest systems and prescribed fires influence snag numbers, and to develop statistically accurate measures of snag attrition rates.

		Before Harvest			After Harvest		
Monitoring Unit	Unit Size	6-<10 in. DBH	10-20 in. DBH	>20 in. DBH	6-<10 in. DBH	10-20 in. DBH	>20 in. DBH
1	20	59	64	18	15	35	12
2	30	55	61	8	20	44	6
3	26	41	25	3	26	12	3
4	18	29	11	3	23	11	3
5	87	98	142	23	NA	NA	NA
6	15	13	15	5	NA	NA	NA
7	70	56	35	10	NA	NA	NA

NA= harvest has not occurred so that post-harvest monitoring is not yet complete.

Recommendations

Re-sample within the fire and salvage logging study area during 2004 and 2005 to monitor snag attrition and the response of primary cavity excavators.

Survey snags before and after timber harvest to determine if snag standards are being met.

Fiscal Year 2001 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item

LANDBIRDS

The goal is to maintain viable populations of landbirds.

How do landbird populations respond to changes in their habitats that result from the implementation of the Dry Site Strategy ?

The conservation of landbirds has become an important management issue on national forest lands in recent years. In 2000 the Forest Service developed the Landbird Strategic Plan that outlined our landbird conservation program. An important element of this program is the development of scientifically credible monitoring programs to understand how forest management activities may influence landbird habitats and populations. On the Wenatchee National Forest, dry forest restoration has been the primary focus of the vegetation management program. Therefore, landbird monitoring efforts have been focused on understanding how dry site treatments may affect landbird habitats, abundance, foraging behavior, and nesting success. These monitoring efforts have been accomplished through two large monitoring stiudies; the Pendleton Study and the *Fire and Fire Surrogate (FFS*) Study.

The Pendleton Monitoring Study was designed and implemented in cooperation with the Wenatchee Forestry Sciences Lab. The pre-treatment bird monitoring occurred in 1996 and 1997. The thinning portions of the dry site restoration treatments were completed in

2000 and post-thinning monitoring was carried out in 2001. In 2002 and 2003 prescribed fire treatments are being carried out and post-fire monitoring is expected to occur in 2004. The *FFS Monitoring Study* is a cooperative effort with the Wenatchee National Forest, Wenatchee Forestry Sciences Lab, and the University of Washington. This is an interdisciplinary study with wildlife being one of the disciplines that is included. In the FFS, pre-treatment monitoring was carried out in 2000 and 2001. Post-treatment monitoring is expected to occur in 2004 and 2005. Presented below are some preliminary data from the Pendleton Study showing the relative abundances of different bird species before and after the dry site restoration thinning treatments. A research publication is being prepared titled: *The Short-term Response of Landbirds Birds to Dry Forest Restoration*, that will provide additional details about this monitoring study. The publication should be available in 2003 and is titled, Monitoring the short-term (1-3 years) response of landbirds birds to thinning treatments implemented in the Pendleton Dry Forest Restoration project.

Species Richness and Diversity

A total of 55 species were detected during the pre-treatment surveys conducted in 1996 and 1997. During the post-treatment surveys conducted in 200, 38 species were detected. There were no significant differences in the total number of detections recorded among years ($P = 0.274$) or treatments ($P = 0.436$). Pre-treatment bird diversity was $H' = 2.551$ and post-treatment bird diversity was $H' = 2.684$. Values for the Shannon Index usually fall between 1.5 and 3.5, and only rarely surpass 4.5.

Species and Guild Abundance

Eight bird species showed differences in their abundances among years (Figure below). Two of these species, the brown creeper ($P = 0.016$) and mountain chickadee ($P = 0.044$) showed significant decreases in abundance across years. For the mountain chickadee this occurred between 1996 and 1997, and was followed by a significant increase in 2001 ($P = 0.001$). Cassins finch abundance increased between 1997 to 2001 ($P = 0.003$), while dark-eyed junco's abundance was signficantly higher in 2001 compared to 1996 ($P = 0.033$). Four additional species or groups of species were significantly higher in abundance during 2001 compared to both 1996 and 1997. These included the flycatchers (Hammonds and Dusky), redbreasted nuthatches, Townsends solitaires, and yellow-rumped warblers.

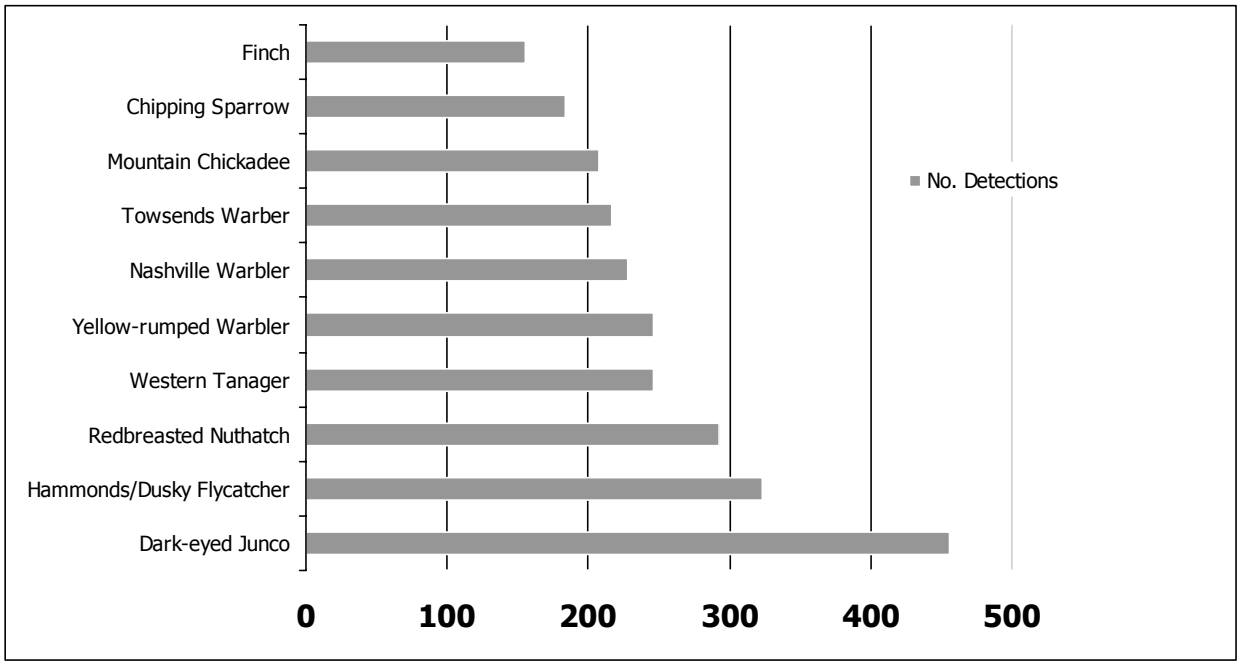
The abundance of three bird species were different among the treatments and control stands. Cassins finches were found in greater abundance in the control stands compared to the standard thin treatment ($P = 0.03$). Conversely, Macgivlery's warbler ($P = 0.037$) and red-breasted nuthatch ($p = 0.015$) abundance decreased in the standard thin treatment compared to the control.

The bark-insectivore foraging guild was the only one that showed a signficant trend. They significantly increased ($P = 0.026$) in abundance following the standard thinning treatments.

Monitoring the Response of Landbirds to Fire and Fire Surrogate Treatments

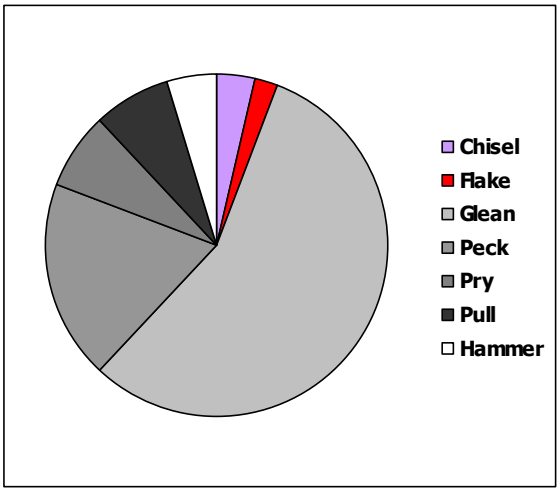
The following figures provide a brief summary of the kinds of information that is being collected for landbirds in the Fire and Fire Surrogate study. This information was collected during 2000 and 2001 in areas that had not been treated with a dry forest restoration prescription. In 2004 and 2005 these same areas will be re-surveyed to monitor landbirds after treatments have been completed. The information presented below is on bird abundance, foraging ecology of bark gleaning birds, and nesting success of landbirds.

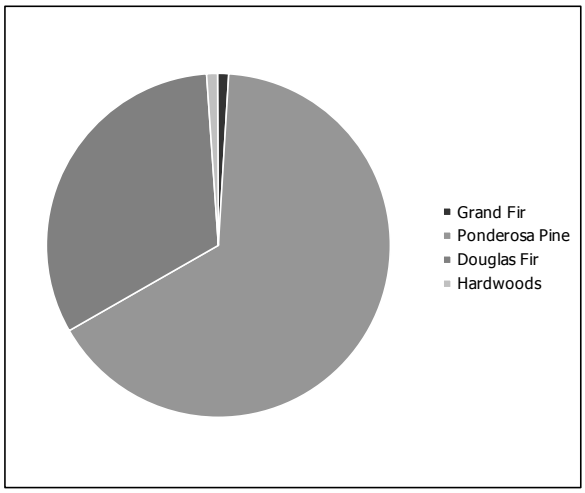
This figure shows the number of detection made for the 10 most common bird species at point count stations. Approximately 4-6 point count stations were sampled within each of 12 dry forest study stands.



Foraging Ecology

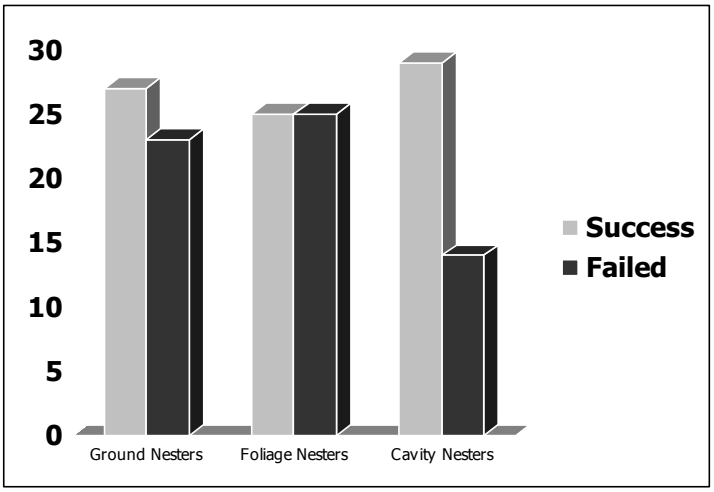
These figures show the foraging behaviors and habitats used by barkgleaner birds. Barkgleaning birds include browncreepers, woodpeckers, nuthatches, and chickadees, who glean insects out of the bark of trees.





Nesting Success

Nesting success provides an important measure of the productivity of bird species and is important to monitor to understand how dry forest treatments may affect bird populations. As this graph shows, about 50% of the ground and foliage nest fail, while birds that use cavities for nest have a much higher success rate.



Recommendations

Complete post-prescribed fire monitoring of landbirds in the Pendleton Monitoring Study.

Complete post-treatment monitoring of landbirds in the FFS Study.

Publish results of short-term response of landbirds to the Pendleton Dry Site treatments and integrate findings into future restoration project designs.

Monitoring Item-

RIPARIAN DEPENDENT WILDLIFE SPECIES

The goal is to maintain viability of riparian dependent species.

Is habitat being maintained for riparian dependent wildlife species?

Riparian habitats typically support the most productive and diverse wildlife populations in temperate forest landscapes. For these reasons, it is important to monitor the populations of wildlife species that are dependent upon riparian habitats. Two efforts have been implemented to monitor riparian wildlife species. The first is an effort to monitor amphibians associated with stream riparian habitats. This effort was initiated in 1992 and is planned to be continued as a long-term monitoring effort (although it may need to be expanded or modified). This monitoring effort samples riparian habitats along small mountain streams within Douglas-fir and mixed conifer forests. The sample sites include areas of three different riparian management strategies (unharvested, riparian buffer, no buffer). The second study was conducted by the Wenatchee Forestry Sciences Lab (J. Lehmkuhl, Principal Investigator) to monitor bird populations in streamside riparian habitats. Results from the riparian bird study are not yet available but will be presented in future monitoring reports.

Results of amphibian monitoring in streamside riparian habitats within Douglas-fir mixed conifer forests.

These results include sample sites from three riparian management strategies (unharvested, riparian buffer, no buffer). These results are based on using pitfall traps to obtain estimates of amphibian abundance.

Year Tailed Frog Chorus Frog L-T Salamander Cascades Frog Totals

Year	Tailed Frog	Chorus Frog	LT Salamander	Cascade Frog	Totals
1992	31	0	0	3	34
1993	31	0	0	7	38
1995	35	0	1	8	44
1996	29	0	1	1	31
1997	15	0	0	1	16
1999	15	1	0	1	17
2001	29	0	0	6	35
2002	22	0	0	2	24
Totals	185	1	2	27	215

The data presented in the above table shows no upward or downward trends in the captures of amphibians within the study sites. This relationship is not statistically significant for either the total number of captures ($r^2 = 0.412$, $F = 1.020$, $p = 0.359$), for the tailed frog captures ($r^2 = 0.477$, $F = 1.471$, $p = 0.279$), or for Cascades frog captures ($r^2 = 0.185$, $F = 0.176$, $p = 0.692$). Continued monitoring is needed and consideration of expanding the monitoring to include additional sites to increase statistical power.

Recommendations

Use data from the riparian amphibian monitoring as a pilot study to determine the statistical power of determining trends in amphibian populations under the current study design. Make adjustments to the monitoring effort according to the results of this analysis.

Integrate the results of the riparian bird study into *Forest Plan* monitoring once they are available.

Fiscal Year 2001 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

DEER, ELK (Forest) AND MOUNTAIN GOAT (High Elevation and Talus) HABITAT

Elk, mule deer and mountain goats use portions of the Wenatchee National Forest as summer, winter and transitional range.

Are populations of ungulates increasing, decreasing or being maintained?

Is habitat capability increasing, decreasing or being maintained?

Managing ungulate populations requires a high level of coordination with the Washington Department of Fish and Wildlife (WDFW). They are responsible for the monitoring of ungulate populations and the results of these efforts need to be incorporated into future *Forest Plan* monitoring reports. An interagency assessment of the habitat capability for the elk herds on the southern end of the Forest was initiated in 2000 and completed in 2002. This assessment established baseline information on habitat capability and resulted in a more accurate habitat effectiveness model than is currently available. Habitat effectiveness is evaluated on a project level basis and is important to meeting the habitat goals for these species. Most importantly, the elk habitat assessment identified information gaps that are important for the management of the elk herds and the ecosystems that they play key roles in. One result of the elk habitat assessment was the initiation of a 5-year cooperative study with the WDFW, Wenatchee National Forest and Wenatchee Forestry Sciences lab to test the habitat model and gather better information about the elk herd and their habitat use. A summary and citation of the elk habitat assessment is provided below. In addition, citation for the elk study proposals are provided and are available.

Gaines, W.L, P.H. Singleton, J. Leingang, E. Bracken, C. Davis, J.F. Lehmkuhl, S. McCorquodale, and L. Stream. In press. Habitat assessment for the Colockum and Yakima elk herds. Gen. Tech. Rep. PNW-GTR. -Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Abstract:

Elk play important roles in ecosystem processes in forest and range habitats in the eastern Cascade mountains of Washington. Complex relationships exist between habitat quality, elk numbers, elk condition, and the integrity of habitats sensitive to grazing. We compiled spatial data and constructed two spatially explicit Bayesian Belief Network models to evaluate the influences of land management alternatives on elk habitat capability and the risk of grazing impacts to sensitive habitats for the Colockum and Yakima elk herds in central Washington State. The BBN models used a decision tree structure and relied on available data and expert opinion to estimate the influence of dry site vegetation treatments, road management, and domestic ungulate and elk grazing on indices of habitat capability and risks to sensitive habitats. Dry forest restoration treatments and domestic ungulate grazing had little influence on these indices except within a few subwatersheds. Road management had the greatest potential to increase elk habitat capability, while elk grazing had the greatest influence on sensitive habitats.

Citations for the elk study proposals are as follows:

Washington Department of Fish and Wildlife (WDFW). 2002. Yakima elk herd study: A proposal – draft. Washington Department of Fish and Wildlife, Olympia, Washington.

Lyons, A., B. Gaines, and J. Lehmkuhl. 2002. Linking Yakima elk herd habitat effectiveness and productivity – draft. U.S. Forest Service, Okanogan and Wenatchee National Forest, Wenatchee, Washington.

During the winter of 2000 and throughout the year of 2001, the Wenatchee National Forest cooperated with the WDFW and Chelan County PUD on a study of mule deer in Chelan County. Currently, mule deer winter range habitat effectiveness is evaluated using a modified version of an elk habitat effectiveness model. This model was found to do a poor job of predicting the occurrence of mule deer during the winter. Therefore, the Chelan Mule Deer Study presented an opportunity to develop a winter range habitat effectiveness model using local data collected during this telemetry study. The study is expected to be completed in 2003 and the results will be integrated into revision of the *Forest Plan* revision. This model will help evaluate trends in habitat effectiveness over time.

Concern has been expressed about the populations of mountains goats on the Forest, and in response, a cooperative effort between the Forest Service and the WDFW was developed to gather baseline information about their populations. Results of initial mountain goat surveys are shown in the following table.

Results of helicopter surveys for mountain goats in watersheds located on the Wenatchee National Forest.
There were no surveys for 2002.

Date	No. Animals	Kids	Watershed/Location
9/13/00	2	1	Icicle
9/27/00	3	0	Icicle
9/13/00	1	0	Wenatchee
9/27/00	9	2	Peshastin
7/26/01	22	6	Kachess
7/26/01	40	13	Blaze Ridge
8/14/01	46	14	Bumping
8/14/01	18	3	Naches Pass
9/29/01	13	0	Lake Wenatchee
9/30/01	2	0	Enchantments

Recommendations

Coordinate with the WDFW to obtain population monitoring data that can be integrated into this report for deer, elk, and mountain goats.

Revise and refine the elk and deer habitat effectiveness models based on the results of the elk habitat assessment and mule deer study. Integrate these models through *Forest Plan* revision and use the models in project level evaluations.

Fiscal Year 2001 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

THREATENED AND ENDANGERED SPECIES

Monitoring Item-

NORTHERN SPOTTED OWL (Strix occidentalis caurina)

The goal is to recover to a viable spotted owl population

What is the level of spotted owl productivity?

Is spotted owl habitat being maintained or restored?

Most spotted owl sites were monitored by the National Council for Air and Stream Improvement (NACSI), the Pacific Northwest Research Lab (PNW) for research purposes, or by the Wenatchee National Forest in 2001. Due to this partnership, 11 years of monitoring information on owls is available. Funding for this long-term monitoring study will run out at

the end of FY 2002. Monitoring of spotted owls will continue through the Northwest *Forest Plan* monitoring program which includes the Cle Elum study area (Forsman et al. 2002). A new study with additional partners will be initiated in 2003 to explore the effects of dry site treatments on spotted owl and barred owl resource selection.

A summary of northern spotted owl monitoring information.

Fiscal Year	Total Activity Centers Monitored	Number of Young Fledged	Number of Young/ Activity Center
1991	170	98	0.6
1992	184	207	1.1
1993	200	38	0.2
1994	187	128	0.7
1995	150	74	0.5
1996	150	83	0.6
1997	NA	NA	
1998	141	NA	
1999	108	26	0.2
2000*	139	57	0.4
2001	198	59	0.3
2002	263	45	0.2

*Does not include data from the Cle Elum Ranger District.

An assessment of the monitoring data available for the Wenatchee National Forest, shown in the above table, was completed to determine if trends (upward or downward) occurred in the productivity at monitored owl sites. Using a simple linear model, no significant statistical trend was detected at this time. However, Forsman et al. (2002) showed a decline in the number of occupied spotted owl territories on their general study of approximately 60% since 1992. Whether this decline is due to harvest of non-federal lands within the study area, the invasion of the area by barred owls, short-term weather patterns, or all of the above, is unknown (Forsman et al. 2002). Very little harvest of forests has occurred on federal lands within the study area since 1989, so there is no reason to believe that harvest of federal forests is exacerbating the problem (Forsman et al. 2002).

An update to the environmental baseline for spotted owls on the Wenatchee National Forest was completed in 2002 (Halupka 2002). This assessment showed that about 4,812 acres of suitable spotted owl habitat have been consulted on for removal or downgrading between 1994 and 2002. In addition, wildfires removed about 10,000 acres of suitable spotted owl habitat during the same time period (Halupka 2002).

All projects with potential effects to any federally protected wildlife species requires agencies to review actions authorized, funded, or carried out by them to insure such actions do not jeopardize the continued existence of listed species. All projects that affected spotted owl habitat have been through this screen. In 2002, a total of 19 projects were consulted on for spotted owls, and 9 of these project had effects to designated critical habitat.

Recommendations

Monitoring should include tracking the changes in the availability of suitable spotted owl habitat over time. Baseline habitat conditions were established in the Wenatchee National Forest Late-successional Reserve Assessment in 1997 (USFS 1997). This information was updated in 2002 and should be revisited in 2007 to track habitat trends.

Continue to monitor >50% of the known spotted owl sites on the Forest in order to track trends in the number of young/site over time.

Validate monitoring suitable spotted owl habitat and spotted owl productivity (young/site) to determine trends in the spotted owl population on the Forest.

Cooperate with the Wenatchee Forestry Sciences lab to monitor how dry site restoration projects are influencing resource selection by spotted and barred owls during 2003-2006.

Fiscal Year 2001 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

BALD EAGLE (Halieetus leucocephalus) THREATENED

The goal is species recovery.

Are existing nest sites producing young as anticipated?

Are nest, roost and perch sites being maintained?

Table showing a summary of the bald eagle monitoring information.

Fiscal Year	Known Nest Sites	Known Young Produced
1989	1	1
1990	2	2
1991	2	2
1992	3	2
1993	4	4
1994	4	6
1995	4	7
1996	5	3
1997	5	4
1998	5	5
1999	4	1
2000*	4	1
2001	4	unknown
2002	5	unknown

*Does not include data from the Cle Elum Ranger District.

These data indicate an increasing number of bald eagle nest sites and the number of young produced over the past ten years. In 1999 and 2000, the number of known young that were produced was lower than the past several years. The reasons for this are unknown but may be a function of inability to monitor the nest fate closely or weather conditions. Subsequent monitoring of productivity will be important to better understand this.

All projects with potential effects to any federally protected wildlife species requires agencies to review actions authorized, funded, or carried out by them to insure such actions do not jeopardize the continued existence of listed species. All projects that affected bald eagle habitat have been through this screen. In 2002, a total of 15 projects were consulted on for bald eagles.

Recommendations

Continue to monitor nests and document the number of young produced.

Fiscal Year 2001 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

PEREGRINE FALCONS (Falco pergrinus)

The goal is species recovery.

How many sites are occupied?

How many young are being produced?

The Wenatchee National Forest has achieved and exceeded the recovery goal of one active nest site. Two new nest sites were discovered in 1999 near Leavenworth. All "good or better" rated cliffs for peregrine nests have been entered into a Geographic Information System (GIS) and are being used to make project assessments.

On August 25, 1999, a notice was published in the Federal Register (64 Federal Register 46542) removing the peregrine falcon from the federal endangered species list. This is due to the continued successful recovery of this species, including several efforts made on the Wenatchee National Forest. This means that it will no longer be necessary to complete consultation with the USFWS on projects that could affect peregrine falcons. However, peregrine falcon nest sites will continue to be protected and monitored.

A summary of the peregrine falcon monitoring information.

The table shows the increasing number of known nest sites and young produced on the Wenatchee National Forest. The continued increase in productivity of the peregrines on the Forest has contributed to their successful recovery

Fiscal Year	Known Nest Sites	Young Produced
1988	0	0
1989	0	0
1990	0	0
1991	0	0
1992	1	3
1993	1	2
1994	2	5
1995	2	5
1996	2-10	4
1997	2-10	7
1998	2-10	3
1999	5	9
2000	5	8
2001	6	10
2002	6	11

Recommendations

Continue to monitor potential and active nest sites.

Prepare site management plans for known nest sites.

Fiscal Year 2001 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

GRIZZLY BEAR (Ursus arctos)

The goal is species recovery.

Are Guidelines for the North Cascade Grizzly Bear Recovery Area being implemented as they become established?

How many class 1 and 2 grizzly bear reports are made annually?

The Grizzly Bear Recovery Plan was completed in 1997 (USFWS 1997) for the North Cascades Ecosystem. Interim Access Management Guidelines and a Sanitation Policy were developed and approved for "No Net Loss" of core areas in 1998. An initial Forest-wide assessment of the availability of core areas was competed in 1998 and the results are shown in the table below. An assessment of the quality of the core areas to meet the seasonal needs of grizzly bears and to develop desired future conditions for the Bear Management Units (BMUs) is being completed in 2002. In 2002, 19 projects were consulted on for grizzly bears.

A summary of the grizzly bear core area monitoring information.

Bear Management Unit	Total Acres in BMU	Early Season % Core Area	Late Season % Core Area
Chiwawa	152,726	60	55
Cle Elum	196,319	Na	35
Icicle	134,878	81	73
Lower Lake Chelan	205,822	63	54
Lower Entiat	169,801	21	21
Lower Wenatchee	225,784	40	41
Peshastin	131,124	40	41
Stehekin	107,289	Na	Na
Upper Lake Chelan	239,430	80	25
Upper Wenatchee	146,333	73	47
Swauk	161,619	Na	62

This information provides an overview of the availability of core areas within the Grizzly Bear Management Units across the Wenatchee National Forest. This information is appropriate to the broad scale assessment that was conducted, but needs to be validated and updated at the project scale. The core areas available within BMUs have been updated for some areas and may not be reflected in this table.

A summary of the grizzly bear sighting information.

Year	Class 1 Observations	Class 2 Observations	Total Observations
1989	1	3	4
1990	0	9	9
1991	3	3	6
1992	0	0	0
1993	0	0	0
1994	0	0	0
1995	0	0	0
1996	0	1	1
1997	0	1	1
1998	0	0	0
1999	0	0	0
2000	0	0	0
2001	0	0	0
2002	0	0	0

Recommendations

Continue to update the core area GIS layer as projects are implemented and better information becomes available.

Continue to implement the Sanitation Policy by making human garbage inaccessible to bears in our campgrounds and recreation sites.

Continue to report and follow up on grizzly bear observations in order to gather sufficient information to determine the validity of the report.

Fiscal Year 2001 Recommendations

Last year's recommendation was the same as this year's recommendation.

Monitoring Item-

GRAY WOLF (Canis lupus) ENDANGERED

The goal is species recovery.

How are forest roads affecting habitat?

How many reports of gray wolves occurred per year?

Gray wolves (Canis lupus) historically occurred throughout the North Cascades. However, extensive predator control efforts and human expansion during the early to mid 1900's greatly reduced their numbers. Recently, gray wolves have been observed at a few locations within the North Cascades, including areas on the Wenatchee National Forest. These reports indicate that gray wolves may be recolonizing the Cascades from source populations in southern British Columbia. Presently no recovery plan or conservation strategy has been implemented for gray wolves in Washington. In 2002 a total of 19 projects were consulted on to determine their potential effects on gray wolves.

A summary of the gray wolf sightings information.

Year	Number of Confirmed and Unconfirmed Gray Wolf Reports	Number Confirmed to be Gray Wolf
1990	2	1
1991	24	1
1992	3	1
1993	0	0
1994	0	0
1995	0	0
1996	0	0
1997	2	0
1998	3	0
1999	1	0
2000	1	0
2001	5	0
2002	1	0

In the early 1990s considerable interagency efforts were made to investigate wolf reports to determine their validity. In 1993 these efforts were greatly reduced as a result of limited funding. Because of this, fewer reports have been made and no reports have been verified for several years. This has made it very difficult to track the number and distribution of gray wolf reports over time.

Recommendations

Track road densities in GIS to monitor habitat effectiveness for wolves.

Cooperate on the development of a recovery plan or conservation strategy for the North Cascades.

Continue to follow up and evaluate wolf reports and track these in a database.

Fiscal Year 2001 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

MARBLED MURRELET (Brachyramphus marmoratus) Threatened

The goal is species recovery.

Are populations and habitat being maintained?

Only a small portion of the Wenatchee National Forest lies within the range of the marbled murrelet and surveys conducted prior to habitat manipulation or disturbances have not revealed any confirmed locations or nest sites. A total of 4 projects were consulted on in 2002.

A summary of marbled murrelet sighting information.

Year	General Observations	# Marbled Murrelet Reported	# Survey Station	# Marbled Murrelet Located
Pre-1989	0	0	0	0
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	0	0
1993	0	0	0	0
1994	1	1	13	0
1995	0	0	14	0
1996	0	0	5	0
1997	0	0	5	0
1998	0	0	*	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	10	0
2002	0	0	0	0

Recommendations

Continue to monitor projects within the range of the species.

Fiscal Year 2000 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

CANADA LYNX (Lynx canadensis) – THREATENED

In 2000, the Canada lynx was listed as a Threatened species under the federal Endangered Species Act. Conservation of lynx is guided by the Canada Lynx Conservation Assessment and Strategy until a recovery plan is completed. Prior to the listing of lynx, surveys were initiated to determine the extent of lynx range in Washington and Oregon, as part of the National Lynx Survey. Several of the survey stations were located on the Wenatchee National Forest. The results of these surveys are shown in the following table. No lynx detections of lynx were made during these surveys. In FY 2002 a total of 15 projects were consulted on for lynx

Results of the 1999 -2001 lynx surveys conducted on the Wenatchee National Forest using hair snagging and DNA analysis.

Year	Total Hits	Bobcat	Cougar	Lynx	Other	*Poor DNA
1999	22	7	1	0	6	8
2000				0		
2001	31	8	0	0	8	12

*Poor DNA means that analysis could not be completed.

Recommendations

Continue to monitor projects within the range of the species.

Monitoring Item-

SURVEY AND MANAGE SPECIES

Survey and Manage species were identified in the Northwest *Forest Plan* as species whose ranges are limited in extent and/or which we have little information about. On the Wenatchee National Forest these species include 7 mollusks, 2 amphibians, and the lynx. The management strategy for the mollusk and amphibian species is to conduct surveys prior to ground disturbance activities.

Known Survey and Manage Sites for Amphibians and Mollusks

Year	Number of Survey and Manage Amphibian Sites	Number of Survey and Manage Mollusk Sites
1997		2
1998	3	20
1999	1	74
2000	0	3
2001	1	3
2002	0	5
Total Known Sites	4	107*

*This number has been revised from last year to reflect clarifications in the taxonomy of the Chelan Mountain snail. Site previously considered Chelan Mountain snail on the Leavenworth Ranger District were determined to be another snail species that is not a survey and manage species.

Recommendations

Continue surveys of projects for survey and manage mollusk species.

Monitoring the effectiveness of the mollusk management protocols where they occur in the dry forests.

Fiscal Year 2001 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Summary of Accomplishments in FY 2002

Through the development of an extensive network of partnerships with other resource areas, government agencies, and private organizations, a sizeable amount of work was accomplished in FY 2002 to inventory and restore wildlife habitats. Inventories and surveys were conducted over approximately 190,000 acres for species that are federally protected as Threatened or Endangered. About 45,000 acres were surveyed for other wildlife species. These surveys provide important information about wildlife numbers and their distribution, and enhance the ability to coordinate activities with other resource specialists to reduce or mitigate potential negative effects. A summary of the habitat restoration accomplishments in FY 2002 is provided in the following table.

A summary of wildlife habitat restoration accomplishments during 1998-2002.

Year	Wildlife Structures	Wildlife Acres	TES Structures	TES Acres
1999	144	1449	53	1534
2000		1300		200
2001		1665		100
2002		2000		100

I. TIMBER OFFERED (ALLOWABLE SALE QUANTITY (ASQ)

AND TIMBER SALE PROGRAM QUANTITY (TSPQ)

The goal is to achieve planned and assumed volumes of timber sold annually and for the planning period in ASQ and TSPQ for the period from FY 1990 to 1993.

Is the Forest offering the cubic foot volume (board feet in the first decade of chargeable timber established by the plan ASQ?

Is the Forest offering the cubic foot volume (board feet in first decade) of non-chargeable timber necessary to achieve the estimated TSPQ?

From 1994, the goal has been amended by the Northwest *Forest Plan*.

The new term to describe timber offered under the amended *Forest Plan* is called ``probable sale quantity" (PSQ). The objective is to estimate sale levels likely to be achieved (PSQ) as opposed to estimating ceiling or upper-limit harvest levels (ASQ). The PSQ in the *Forest Plan* is to sell 24.2 million board feet per year.

Timber harvested during FY 2002, as reported in the Timber Cut and Sold Summary, is 22.8 MMBF. See Timber Offered/Harvested Table for details of current and past harvest. The trend for timber harvested for the last five years has averaged 24.9 MMBF.

Timber Offered/Harvested

Fiscal Year	Timber Offered (MMBF)	Timber Harvested (MMBF)
1993	16.8	58.4
1994	12.0	32.5
1995	98.8	19.9
1996	92.5	91.7
1997	50.4	56.4
1998	43.2	27.0
1999	27.7	34.3
2000	38.4	20.4
2001	20.0	20.2
2002	19.2	22.8

Another indicator utilized is the Program Sale Statement (PSS). The PSS is used as a source of annual program accomplishment in terms of area and volume by timberland suitability class, harvest activity, forest-type group, and product. Cumulatively, this information reflects total *Forest Plan* accomplishment relative to the long-term sustained yield capacity or the allowable sale quantity (FSM 2492.12). The Program Sale Statement for the Wenatchee National Forest is on PSS Table.

Program Sale Statement

Fiscal Year	Chargeable (MBF)		Non-Chargeable (MBF)	
	Dead	*Live*	*Dead*	*Live*
1993	11,334.45	1,422.17	3,889.25	35.6
1994	6,044.34	7,820.47	2,389.53	181.2
1995	52,317.96	444.80	2,008.49	3.0
1996	62,512.39	12,783.70	6,152.15	13.8
1997	5,242.31	5,049.11	22,482.81	146.2
1998	7,920	4,247.9	20,453.9	4,910.4
1999	4,906.85	12809.86	2793.35	1200.61
2000	321.95	15504.22	3380.75	1484.07
2001	811.53	23525.72	3930.28	1446.19
2002	656.96	9288.66	4049.34	1470.62

Note: Chargeable volume is volume removed from land allocations that are part of the suitable timber base, and non-chargeable volume is volume removed from land allocations outside the suitable base.

The PSS volume for FY 2002 went down 48 percent from the previous year. The direction in the *Forest Plan* states that the PSQ levels are estimates. They represent neither minimum levels that must be met, nor maximum levels that cannot be exceeded. They are rough approximations because of: 1) the difficulty associated with predicting actual timber sale levels over the next decade, 2) the when and where to offer timber sales, and 3) the complex nature of many of the land management agencies to develop new timber sales that conform to the planning amendments.

The trend from the Program Sale Statement for the last five years has averaged 25.0 MMBF. The average is slightly above the PSQ (24.2). The volumes from the Program Sale Statement have come down and are reflective of what would be expected, based on the *Northwest Forest Plan*.

The PSQ on the Wenatchee National Forest is conforming to the direction addressed in the Northwest *Forest Plan*. Approval of PSQ estimates for *Northwest Forest Plan* Forests was amended for Region 6 (Letter from Regional Forester, dated December 1, 1998, 1920/2410) and the Wenatchee National Forest's direction remained the same.

Recommendations

Continue to sell timber as directed in the *Forest Plan*.

Continue to monitor PSQ utilizing the STARS and PSS databases and compare volume to projected decade trend.

Fiscal Year 2001 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

TIMBER HARVEST UNITS (Size, Shape and Location)

The goal is to manage vegetation cover to meet direction on size of openings created by National Forest timber harvest. The monitoring question is:

Are the Forest Plan Standards and Guidelines regarding the size and dispersal of openings and condition of adjacent vegetation (e.g. height of trees in adjacent areas) being appropriately implemented?

Based on the PSQ of 24.2 MMBF, the amount of clearcutting that would be expected is 484 acres per year (based on the original *Forest Plan* assumptions). During Fiscal Year 2002, 22.8 MMBF was harvested from 2,971 acres. There were no clearcuts this year. The forest had 116 acres of preparation cuts, 132 acres of seed cuts, 107 acres of removal cut, and 34 acres of selection cut. The remaining 2,582 acres were thining cuts. The timber program focus for the immediate future is thinning in dry forested areas to reduce the potential for large crown fires as experienced in 1984, 1994, 1998, 2001, and 2002. Consequently, the program involves very little clearcutting.

The five-year trend for acres regenerated and intermediate harvest are indicated in the following table.

Acres Regenerated FY 1996 to 2001

Fiscal Year	Clear Cut	Prep Cut	Seed Cut	Removal Cut	Select Cut	Improve Cut	Thin Cut	Sani. Cut	Special Cut	Total Cut
1996	9	0	0	138	348	0	0	13074	0	13569
1997	0	279	32	12	172	0	270	4731	0	5496
1998	12	25	129	26	213	0	307	727	0	1439
1999	19	0	12	359	909	0	706	412	0	2417
2000	0	0	46	0	123	0	1748	144	0	2061
2001	0	0	0	0	1086	0	1672	0	0	2758
2002	0	116	132	107	34	0	2582	0	0	2971
Avg.	6	60	50	92	412	0	1041	2727	0	4387

From Fiscal Years 1996 to 2002, very little acrage has been harvested using silviculutural systems that create openings in the forest landscape. Stand replacing wildfires have created very large openings in the forested landscape, especially on the dry sites. The priority has been to treat landscapes that are overstocked with thinnings from below, reduce fuels and crown density, and to salvage trees that have been damaged by wildfires, insects and disease. As as result of this *Dry Forest Strategy* and the *National Fire Plan*, the size and dispersal of openings and condition of adjacent vegetation meet the *Forest Plan* Standards and Guidelines, as amended by the *Northwest Forest Plan*.

Volume sold during FY 2002 indicates the same trend as above. No clear cuts are scheduled or planned for any timber sales sold during FY 2002. Only selection cuts, thin cuts, and sanitation cuts are planned for the volume sold in FY 2002. Large stand replacing fires are creating large openings on the forest, but this is not due to planned or accomplished harvest activities.

The Wenatchee National Forest is meeting its *Plan* Goals and Objectives. The decrease in harvested acres from the 1990 *Forest Plan*, along with the shape, size, and location has been accomplished to coincide with the new goals and objectives in the *Forest Plan*.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2001 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item-

TIMBER HARVEST

The goal is to ensure that regeneration harvests are not prescribed for areas where average annual growth has not generally reached culmination of mean annual increment. The monitoring questions are:

Are stands being harvested at an age and condition that produces the expected growth measured on an average annual cubic foot basis?

Is the amount of volume removed consistent with amounts sold?

In 2002, 0 acres were clearcut. Since 1993, the two issues that have been directing the timber harvest have been the *Northwest Forest Plan* and the salvage related to the wildfires. This has reduced the planned regeneration harvest acreage to near zero. The focus has been to harvest fire salvage (sanitation/selective tree removal) and thinning from below on overstocked stands, especially on the drier ecosystems within the Forest Matrix and associated Late-Successional Reserves (accelerate/protect/enhanuce late successional characterisics).

Acres treated will remain high as harvest shifts towards thinning of small trees from large portions of the landscape with low volumes per acre being removed. In the next few years, the majority of the PSQ volume will come from *Dry Site Strategy* sales.

Timber sales sold during FY 2002 reflect the strategy for the management of dry forest vegetation. The purpose of these timber sales are to reduce fuels and to help reduce large wildfires, improve long-term ecosystem sustainability and be economical. These goals are being attained.

Stands being scheduled for regeneration are within 5 percent of the culmination of mean annual increment. The Timber Sold/Harvested Table shows the current and past levels of timber sold/harvested.

The last five-year trend indicates the Forest has harvested 28.9 MMBF/year. The amount has been consistent with the *Forest Plan* as amended by the Northwest *Forest Plan*. The higher amounts harvested reflects volumes removed from wildfires. Since then, the amount harvested, especially from regeneration acres has been lower and continues to reflect the Northwest *Forest Plan* direction.

The volumes harvested in the last five years have been harvested at an age and condition that produces the expected growth measured on an average annual cubic foot basis. The trees that are being thinned from below or salvaged are trees that have very slow growth rates and are suppressed and need to be thinned to help maintain or improve the vigor of the remaining trees.

Timber/Sold Harvested

Fiscal Year	Timber Sold (MMBF)	Timber Harvested (MMBF)
1993	20.2	58.4
1994	16.1	32.5
1995	54.5	19.9
1996	80.5	91.7
1997	30.7	56.4
1998	29.1	27.0
1999	15.5	34.3
2000	20.7	20.4
2001	29.7	40.1
2002	14.1	22.8

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2001 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item-

SILVICULTURAL PRACTICES

The goal is to ensure that silvicultural prescriptions are appropriate, effective and consistent with resource objectives for each management area. The monitoring questions are:

How many acres of each planned silvicultural practices have been accomplished?

Have silvicultural prescriptions met objectives set for each management area?

Are managed stands growing at the rates estimated by Forest Plan yield models?

The following Table shows the summary of silvicultural activities for 1996 to 2002.

Silvicultural Activities

Activity	2002 Acres	2001 Acres	2000 Acres	1999 Acres	1998 Acres	1997 Acres	1996 Acres
Release and Weeding	112	576	160	134	271	598	410
PCT	1167	2776	1,853	1251	1672	1467	756
Pruning	223	726	614	291	258	0	5
Fertilization	0	0	18	0	28	46	103
Acres planting	706	5107	6,966	3462	9247	10256	5858
Site Prep. For Planting or Seeding		119	309	312	499	280	863
Animal Damage Control	118	203	25	737	775	679	117
Harvest- Clearcut	0	0	0	19	12	0	9
Harvest- Removal Cut (prep/seed/removal)	355	0	46	371	180	323	138
Harvest- Selective Cut (select/thin)	2616	2758	1871	1615	520	442	348
Harvest- Sanitation	0	0	144	412	727	4731	13074
Natural regeneration without site prep.	1143	1084	6154	9371	6987	6361	8514

The silvicultural prescriptions have been implemented to foster and promote the different types of land attributes in the *Forest Plan*. The different types of silvicultural prescriptions are meeting the objectives for each type of management area.

The current program is aimed at the salvage from the wildfires and reducing the overstocked stands in the dry forest ecosystem. The original intent of the *Forest Plan* was to establish plantations on lands that were allocated as General Forest. The use of improved growing stock and an aggressive tree improvement program were aimed at making sure the *Forest Plan* was implemented. To a lesser degree, the Wenatchee National Forest is continuing to utilize the TSI approach, but with a focus at treating landscapes instead of individual trees or stands. As a result of the *Dry Site Strategy* the Wenatchee National Forest is aiming prescriptions at reducing stocking levels so growth will be maintained on sites that already have maximum stand density index. The current silvicultural prescriptions are meeting the intent of the *Forest Plan* to insure that stands are growing at rates that are being estimated by yield models.

The last five-year trend is consistent with the Wenatchee *Forest Plan*. The Forest continues to stress treating landscapes instead of stands or trees. The silviculural treatments reflect an upward trend in TSI, especially in precommercial thinnings, prunings, and commerical thinnings. The major obstacle to achieving silvicultural goals is funding in timber stand improvements, especially precommerical thinnings. This trend has not changed, due mainly to funding reforestation as a higher priority and not funding the overall needs, both locally and regionally.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2001 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item-

REFORESTATION

The goal is to minimize the amount of time between the removal of existing trees and reforestation with desired species. The monitoring questions are:

Is adequate tree stocking for each management area achieved within the time frame established with the desired silvicultural method?

Have adequate numbers of trees of desired species been established to realize optimum growth for management area?

The Wenatchee National Forest monitors reforestation by tracking the acres that are reforested every year. The tracking is accomplished by, and reported in, the Silva Database in TRACS and in the Survival and Growth Report.

Many of the acres reforested were not harvested. There is no direct relationship between acres reforested and acres harvested within the burn area. Some areas did not need to be reforested because of natural regeneration, unsuitability to reforestation or had good stocking.

During FY 2002, 1,847 acres were planted with tree seedlings, or were reforested naturally. Most of the acres were planted in stands that were burned in wildfires.

The Survival and Growth Report is based on field surveys conducted by ranger district personnel and field visits by the Resources Staff. The field visits indicated that the appropriate species and planting stock are being utilized on sites that required reforestation. First year survival for FY 2002 was 37 percent and third year survival was 56 percent. The lower first and third year survival results reflect on acres planted in the fires that occurred on Chelan Ranger District. These sites are drier and have less fertile soils and are more difficult to reforest. Some sites were also planted in the fall during 2001. The bareroot stock was hot planted from nursery stock that took too long to be deliver and resulted in below average survival. The use of bareroot 1-1 stock versus 1-0 plug stock on these drier sites will be utilized to improve survivability. The report shows that 97 percent of the acres reforested were determined satisfactorily stocked at the time of the third year exam; and, 97 percent of all acres certified in FY 2001 met prescribed stocking objectives, with one treatment.

Five year growth and survival report -- FY 1996-2002

Fiscal Year	1st Year Survival	3rd Year Survival	Sat. stocked By 3rd exam	First time Success
2002	37%	56%	97%	97%
2001	86%	71%	93%	89%
2000	82%	73%	96%	100%
1999	82%	78%	97%	95%
1998	74%	64%	89%	94%
1997	87%	72%	94%	92%
1996	76%	82%	85%	88%
Average	75%	71%	93%	94%

The seven-year trend, as indicated in the table above for growth and survival is fairly consistent. First year survival averages 75% while 3rd year survival averages 71%. Past (before the *Northwest Forest Plan* amendment) survival rates used to be higher because the Forest was harvesting higher quality sites (more mesic) that were easier to reforest and more effort was utilized via Knutson-Vandenberg (KV) funding to do site preparation. The Forest continues to plant a variety of species and continues to monitor growth and survival of tree seedlings planted over a three-year period to insure adequate numbers of trees are being stocked.

Recommendations

Utilize 1-1 bareroot or plug-1 stock with large roots to help increase survivability. Do not use 1-0 stock on dry lower elevation ecosystems.

Continue monitoring as scheduled.

Fiscal Year 2001 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item-

LANDS NOT SUITABLE FOR TIMBER MANAGEMENT

The goal is to verify that technology and/or other information has not been developed to justify reclassifying lands from a "not suitable" status to "suited for timber management", or vice versa. The monitoring questions are:

Have the lands that were identified in the Forest Plan as not suitable for timber management now become suitable for timber management?

Is the suitable/not suitable land classification accurate as identified in the Forest Plan database?

Suitability is being monitored at the ranger districts by the silviculturist. There appear to be no problems with identifying acres that do not meet *Forest Plan* Standards and Guidelines. Any new changes are being updated in the GIS database.

Recommendations

Continue to utilize the NEPA process to determine suitability of lands.

Continue to update the Wenatchee National Forest GIS layer that keeps track of suitability.

Continue to monitor the reforestation success on all lands that are harvested or deforested by wildfire, especially on the drier, low elevation sites that tend to have more difficulty regenerating.

Fiscal Year 2001 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

J. SOIL, WATER, FISHERIES AND RELATED WATERSHED MANAGEMENT

Monitoring Item-

MAINTENANCE OF LONG-TERM SOIL PRODUCTIVITY

The goal is to manage the soil resources by implementing management practices that maintain or enhance productive soil nutrient and water cycles. The monitoring question is:

Is soil productivity being protected?

Soil productivity may be reduced by the mechanisms of compaction, erosion, mass failure, severe burning, and negative alteration of nutrient cycling. To maintain soil productivity, all natural soil processes should be maintained.

The *Forest Plan* Standard states that no more than 20 percent of an activity area shall be in a detrimentally disturbed soil condition, including roads and landings. Detrimental soil conditions include compaction, displacement, erosion, puddling, and severe burning. A second *Forest Plan* Standard stipulates the minimum amount of intact ground cover one and two years after an activity, dependant on the erosion hazard of the soil.

Past monitoring has shown that past timber sales have not always met the soil standard (Wenatchee National Forest Monitoring Report 2000). Multiple entries, fragile soils, and ground-based (for example tractor) harvest were factors increasing the risk that soil standards might not be met.

The Wenatchee National Forest is incorporating mitigation measures of soil compaction effects for vegetation treatment in compliance with regional soil quality standards and project NEPA documents. The Forest is updating policy on ground based vegetative treatments.

Examples of measures that will be incorporated into NEPA documents are listed below.

Continue to monitor soil rehabilitation techniques.

Emphasize early documentation of existing soil resource conditions.

Update and revise the Ground Based Harvest Policy to incorporate new monitoring results and to incorporate the Okanogan National Forest into the policy.

Reevaluate and refine winter harvest methods.

Utilize yarding equipment that maximizes trail spacing and minimizes trail widening and off-trail displacement.

Emphasize skid trail spacing and width and encourage operator practices that achieve better results.

Emphasize leaving skid trails and landings in a condition that facilitates effectiveness of selected restoration treatment. For example, in a skid trail that will be treated with a self-drafting winged subsoiler, reduce wood and stumps in the skid trail.

Recommendations

Continue existing monitoring program and incorporate the measures listed upon into project analysis.

Monitoring Item –

FISH/RIPARIAN STANDARD AND GUIDELINE IMPLEMENTATION

Are Standards, Guidelines and Related Best Management Practices (BMPs) for fish habitat and riparian areas as defined in the Forest Plan being applied in the design and execution of timber sales, watershed restoration, and other projects where fish/riparian standards are a concern?

Upper Yakima (Cle Elum Ranger District) Implementation Monitoring of Controlled Burning

In spring 2002, 60 acres in the Johnson Thin area on Cle Elum Ranger District were spring burned. One unit was burned that had been listed in EA as a unit not to burn. This unit burned hotter than desired, with resulting resource damage. Disciplinary actions were taken, and in 2003, maintaining burn plan consistency as outlined in planning documents was emphasized at the highest district staff levels. For more information contact Cle Elum District Ranger.

Yakama Nation Fisheries Fine Sediment Monitoring Report 2002 (Jim Matthews).

Upslope restoration in Little Naches watershed 1986-2001 involved reduction of fine sediment delivery from roads to streams: measures included road abandonment, improving cross-drains, and ensuring ditches did not deliver to the stream system (Mark Muir Masters Thesis, University of Washington 2003: Evaluation of restoration projects and channel changes in the Little Naches basin, with a comparison to the American River basin, WA). Two extreme high flow events occurred during this time period (1990 and 1996). Monitoring indicates that fine sediments appear to be decreasing in Little Naches River. For greater discussion of Little Naches restoration see monitoring item "Aquatic Habitat Objectives" below, or consult Yakama Nation Fisheries Fine Sediment Monitoring Report 2002, Jim Matthews.

Recommendations

Continue existing monitoring program.

Monitoring Item –

EFFECTIVENESS OF RIPARIAN STANDARDS AND GUIDELINES

Are Standards and Guidelines that describe Desired Future Conditions for specific riparian areas/fish habitat being met?

Standards and Guidelines that describe desired future conditions are not being met in all riparian/aquatic areas. There are two reasons for this: 1) some of the Standards and Guidelines need refinement; and 2) some of our riparian/aquatic areas are not in a "healthy" (all natural processes functioning appropriately) condition.

Aquatic zones protected by the *Forest Plan* include streams, lakes, and wetlands and their riparian zones, as well as unstable slopes (because they may be significant source/delivery zones for channel materials). Monitoring to date has focused on streams and lakes.

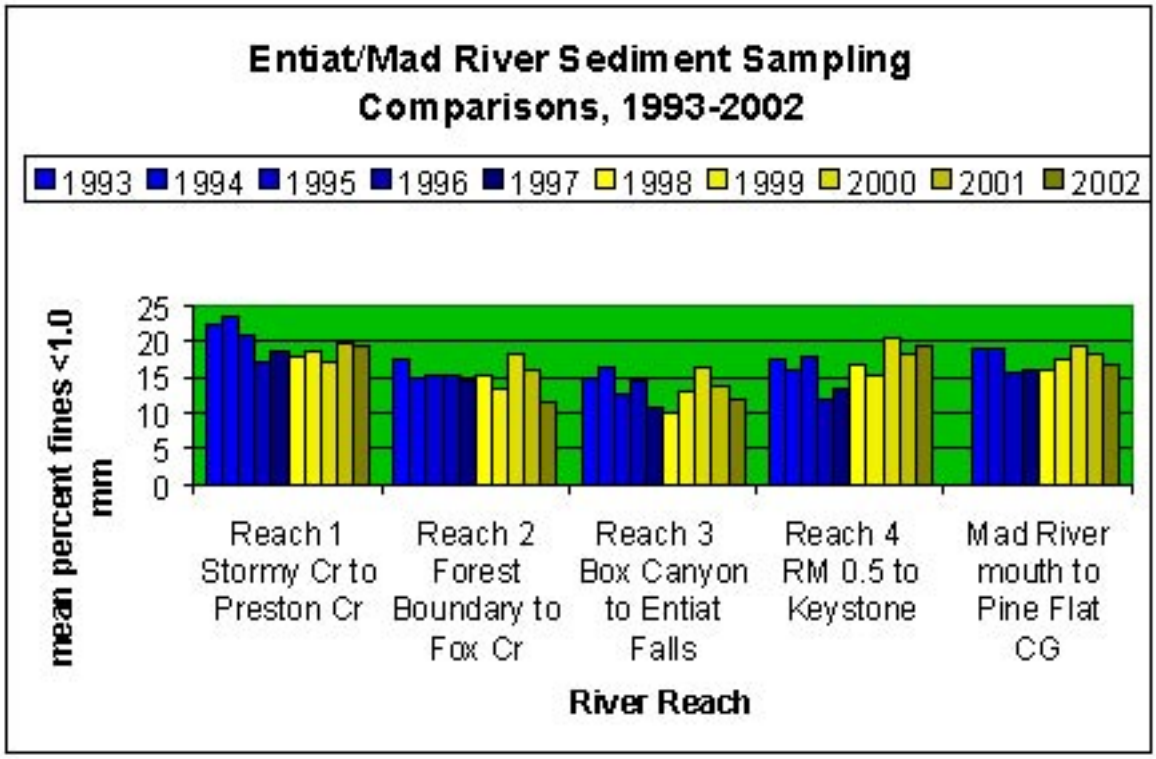
Monitoring programs to assess the condition of riparian areas and fish habitat include: habitat surveys, hydrologic surveys, stream temperature monitoring, spawning gravel fine sediment monitoring, high lakes monitoring, and macroinvertebrate monitoring. In 2002, momitoring focused on fine sediment, stream temperature, and habitat surveys.

Fine Sediment Monitoring:

Fine sediments appear to be decreasing in Little Naches watershed. See monitoring item "Aquatic Habitat Objectives" below, or consult *Yakama Nation Fisheries Fine Sediment Monitoring Report 2002*, Jim Matthews.

In the Entiat basin, fine sediment has been monitored in five reaches since 1993. *Forest Plan* Standards have been exceeded only a few times during that time period: in 1993-95, in reach one (Entiat River between Stormy and Preston) and in 2000 in reach 4 (Entiat River between RM 0.5 and Keystone). Fine sediment levels are lower in upper reaches of Entiat River than in lower reaches, and correlate with flow conditions. For more details see Entiat Ranger District 2002 Sediment Monitoring Report.

Entiat and Mad Rivers Fine Sediment Sampling Comparisons, 1993-2002.



Stream Temperature: The *Wenatchee National Forest Land Management Plan* Standard and Guidelines for temperature in Class I, II and III streams are: a) the maximum temperature will be less than or equal to 61 degrees Fahrenheit on any day and/or the average 7-day maximum temperature will be less than or equal to 58 degrees Fahrenheit; b) where streams naturally exceed the above standards, management activities will not cause further measurable temperature increase.

Naches Ranger District, 2002 Stream Temperature Monitoring

During the summer of 2002, a total of 51 stream temperature sites were monitored on the Naches Ranger District. At 16 of these sites air temperatures were also monitored. Many of these sites were a continuation of the monitoring started in 1998 as part of the cooperative project with the Environmental Protection Agency and include longitudinal profiles on the Little Naches, American and Bumping Rivers. The summer of 2002 can be characterized as one with nearly average streamflows. Monthly average air temperatures were approximately 1 to 2 degrees above normal for June and July and 1 to 2 degrees below normal for August. Maximum summer water temperatures were approximately 1.0 degrees F. below long-term averages for most sites.

In the Entiat basin, a total of 5,913 stream-days of water temperature monitoring were accomplished in 2002 compared with 8,904 stream-days in 2001. Data from the USFWS Entiat Hatchery location contributed an additional 273 stream-days to the temperature monitoring database, for a total of 6,186 stream-days of monitoring completed in 2002. The Forest Plan Standard specified maximum of 61°F. on any day was exceeded on 374 stream-days in monitored Entiat and Chelan streams, including the Entiat River, Mud, Potato, Preston, Roaring, Stormy, Mad, Prince, and Twenty-Five Mile Creeks. The Forest Plan Standard average 7-day maximum temperature of 58°F was exceeded on 665 stream-days in these same streams. See Entiat and Chelan Water Temperature Monitoring Report 2002 for specifics.

The highest recorded stream temperatures on the Entiat Ranger District occurred during the week of August 11-16, mostly on August 14, and consisted of the following: 66.0°F in Potato Creek; 66.4°F in lower Roaring Creek; 67.4°F in the lower Mad River near Tillicum Creek; and 72.1°F in the Entiat River (RM 1.4). The highest recorded temperatures on the Chelan Ranger District were: 65.1°F in Prince Creek and 61.8°F in lower Twentyfive-mile Creek.

Climate data from the Entiat National Fish Hatchery indicated that the lower Entiat basin experienced slightly warmer than average air temperatures and below average levels of snowfall (2001-2002 winter) in comparison to the twelve-year average (1989-2001). Climate data from a weather station near Entiat RM 18 indicated that 16.6 inches of precipitation accumulated during the 2001-2002 water year, which was 86% of the 7-yr average at this site and 66% to 83% of the Entiat Cooperative River Basin Study (1979) estimate of 20 to 25 inches per year within this area.

Temperature monitoring continued in the Wenatchee, Upper Yakima, Tonasket, and Methow basins as well in 2002; however analysis of the data is not complete. For more information in these basins, see the 2001 Temperature Monitoring reports for Leavenworth, Cle Elum, Tonasket, and Methow Valley Ranger Districts. Raw data for 2002 is also available.

Lake surveys: Lakes have been monitored 1989-2002 for riparian condition, water chemistry, phytoplankton and zooplankton, fish species, age, and condition. Water chemistry data have been supplied to the Forest Service's Regional Air Quality Specialist for analysis and comparison to EPA lake monitoring in the mid-1980's (contact Janice Peterson, Mount Baker - Snoqualmie National Forest, for more information). Otoliths have been supplied to Washington Dept of Fish and Wildlife (WDFW) for age analysis (contact Ken Williams, WDFW, for more information). Riparian information has been useful for coordinating with Forest Service recreation personnel regarding concerns raised by recreational uses. Recreation personnel sometimes suggest a lake for monitoring when they suspect concerns exist.

A long-term goal of the lake monitoring effort is to use the data to assist formulation of stocking recommendations to help the Forest coordinate with state stocking programs while protecting resources, especially fish-less lakes and downstream native fish populations. Other goals include monitoring long-term changes in regional air quality through changes in lake chemistry and determining impacts of recreation use.

Stream surveys: Periodic stream surveys of all major streams on the Wenatchee National Forest allow characterization of channel condition and function. Qualitative and quantitative data and photo-documentation are collected. This data is combined with hydrologic surveys,

geomorphic analysis, and data from related systems to a complete as possible understanding of the stream, riparian and watershed functioning. This data forms the backbone of much of our project analysis, watershed analysis, and Endangered Species Act (ESA) consultation.

Stream surveys have been conducted following a standard Region 6 protocol since 1989. Over 1600 miles of stream have been surveyed on the Wenatchee National Forest. Streams surveyed in 2002 include Box Canyon, Lion Gulch, Indian, White, Barton, Little Rattlesnake, Rock, and Roaring. Please refer to individual survey reports for more information.

Recommendations

Continue existing monitoring program.

Monitoring Item-

LONG-TERM TRENDS IN WATERSHED CONDITION

The goal is to evaluate the potential direct, indirect and cumulative effects of proposed activities on water resources. The monitoring question is:

Is watershed condition being maintained or improved?

Stream level recorders have been operated in the following ten watersheds since FY 2000. The recorders provide a long-term record of stream level sampled every 30 minutes. Streamflow measurements are made periodically during the year at each site and a relationship established between streamflow volume and water level. Instruments also record water and air temperatures. The instrumented watersheds are:

Watershed Name	Ranger District
Chikamin Creek	Lake Wenatchee
East Branch Mission Creek	Leavenworth
Lion Gulch	Cle Elum
Mission Creek	Leavenworth
Nile Creek	Naches
Oak Creek	Naches
Phelps Creek	Lake Wenatchee
Potato Creek	Entiat
Swauk Creek	Cle Elum
Tillicum Creek	Entiat

The monitoring objective is to measure long-term streamflow and water temperature regimes on representative watersheds. Chikamin and Phelps Creeks are higher elevation, high precipitation zone watersheds and both watersheds are fairly undisturbed. Phelps Creek has a water diversion for power generation purposes for the Trinity Mine site. East Branch Mission Creek, Lion Gulch, Mission Creek, Nile Creek, Oak Creek and Swauk Creek are dry site watersheds where management emphasis is to reduce fuel loadings and improve forest health so as to reduce the risk of large-scale fire. Both Potato Creek and Tillicum Creek were burned in the 1994 wildfires. The Tillicum site was previously an instrumented site operated by the USGS. Documenting the streamflow and water temperature regime for these watersheds will be used as an indicator of long-term watershed health and condition. Data collected to date

show watershed hydrographs for relatively average water yield years 2000 and 2002 compared to the very dry drought year of 2001.

Results: Data are plotted on graphs for each water year and are used to characterize water yield and timing of runoff for various areas of the forests. Detailed runoff and water temperature data records are available at the Supervisor's Office.

Recommendations

Continue to operate instruments to create a long-term monitoring record.

Monitoring Item –

FISH MANAGEMENT INDICATOR SPECIES (MIS) POPULATIONS

Are viable populations of Management Indicator Species (MIS) being maintained?

Management indicator species on the Wenatchee National Forest are spring chinook, summer chinook, sockeye, steelhead and cutthroat trout. Bull trout will be discussed here because they are federally listed under the Endangered Species Act (ESA).

Spring chinook in the Yakima basin are not federally listed; all other spring chinook on the Forest are federally listed as endangered. Steelhead in the Yakima basin are federally listed as threatened; steelhead elsewhere on the Forest are federally listed as endangered. Bull trout are federally listed as threatened throughout Wenatchee National Forest. Westslope cutthroat were petitioned for listing and are under state review.

As their ESA status suggests, all of these species are thought to have declined in the lower 48 states relative to their abundance 200 years ago. On the Wenatchee National Forest, the greatest threats to native resident species (e.g. westslope cutthroat) are genetic impacts, habitat fragmentation, and in some cases loss of a fluvial life history. Population dynamics of anadromous fish (including chinook, sockeye, and steelhead), which migrate to the ocean and then return to streams to spawn, are strongly influenced by ocean conditions and off-forest migration corridor factors (e.g. agricultural, dam, and mainstem Columbia impacts).

On the Wenatchee National Forest, the amount, quality, and connectivity of habitat for these species appears to has been largely stable or improving over the last decade (see monitoring items above). Abundance of anadromous fish is monitored by counts at dams, and by redd surveys. A number of agencies cooperate in this monitoring including Yakama Nation, Chelan County PUD, Washington Department of Fish and Wildlife, and US Fish and Wildlife Service, and Wenatchee National Forest.

Populations of anadromous fish have fluctuated hugely over the last two decades (for dam counts see **www.fpc.org**; for redd counts contact Chelan Co PUD). Given these fluctuations, it is difficult to make definitive statements about population trends. However it appears that viability of anadromous MIS is being maintained on the Forest.

The Forest continues to expand its knowledge of fish distribution and abundance through snorkeling, minnow trapping, and during the course of other surveys (e.g. stream surveys, lake surveys). The Forest actively coordinates and assits other agencies with bull trout and steelhead redd surveys and the collection of genetic samples.

Cutthroat

Distribution and abundance data indicate that cutthroat are widely distributed on Wenatchee National Forest and locally abundant at many sites (WNF snorkel, stream survey, and other records). Less is known about genetics, habitat fragmentation, and potential loss of a fluvial life history. Ongoing cutthroat genetics monitoring continued in 2002 and will continue in 2003. Preliminary results indicate that strong, genetically unique populations persist at a number of sites on the Wenatchee National Forest, despite widespread historic and current stocking of cutthroat trout (of potentially different genetics) and non-native rainbow trout that also have the potential to disrupt cutthroat populations genetically. Final results of the cutthroat genetics study are expected in 2004 from the University of Montana.

Bull Trout

Bull trout are found in all subbasins on the Wenatchee National Forest except Chelan. Bull trout inhabited these subbasins historically but are currently believed to be extinct in these areas.

The Wenatchee National Forest, the Washington Department of Fish and Wildlife and the US Fish and Wildlife Service are cooperatively monitoring bull trout redds using a standardized protocol. Surveys are conducted annually on "index" streams. Counts for a few streams began in the early 1980's; most long-term index reaches date back to 1989. The monitoring focuses on migratory populations.

Chelan basins: Bull trout are believed to be extripated from this system.

Entiat basin: There is a small and apparently increasing population in Mad River, with some connectivity to a very small number of bull trout in Entiat River. The population appears to have doubled in the past decade, but is of concern due to its isolation and low numbers.

Wenatchee basin: There appears to be connectivity among all monitored populations in the Wenatchee basin. Isolated bull trout populations exist in the Wenatchee basin (Icicle watershed and Ingalls Creek). There is little information about the isolated populations in the Wenatchee basin but it is assumed they are at risk.

Upper Yakima basin: Four small populations, spatially isolated from each other by dams, are known from the upper Yakima basin. All are at extreme risk due to isolation and low population size. For Kachess and Keechelus populations, there are redd counts dating back to 1984; for Cle Elum and Teanaway populations, there are only recently located redds. Wenatchee National Forest is a partner in a genetics study of Yakima bull trout.

Naches basin: Three or four populations occur in the Naches, two of which are isolated by dams; the remaining fish may be either a single population or two separate populations. The two isolated populations (Bumping and Tieton Reservoirs) are moderately large, but the Bumping population is not spatially diversified (*Entiat and Mad* Rivers Fine Sediment *Sampling Comparisons*, 1993-2002), and is stable in South Fork Tieton. Redd counts appear to be increasing in Indian and Deep Creeks.

Steelhead

Summer steelhead populations on the Wenatchee National Forest are a mix of naturally spawning and hatchery fish. All stocks on the Wenatchee National Forest are depressed. In the Wenatchee and Yakima basins, the majority of the steelhead run is wild (naturally reproducing). Steelhead in the Yakima basin are federally listed as threatened, and steelhead in all other basins on the Wenatchee National Forest are federally listed as endangered

Spring Chinook

Spring chinook in the Yakima basin are not federally listed due to the presence of other strong populations in their Ecologically Significant Unit (ESU). All other spring chinook on the Wenatchee National Forest are federally listed as endangered. All spring chinook stocks on the Wenatchee National Forest are depressed and of critical concern. These populations oscillate naturally. Recent high returns are likely attributable to an oscillation peak; the runs will return to an oscillation valley in the near future, and these valleys are becoming extremely low and have continued to decline over the past decades. Care needs to be taken to make sure that no management action has a negative impact on the the elements of fine sediment, temperature and habitat complexity on chinook habitat. In 1998, 407 wild adult spring chinook were collected at Rosa dam for Cle Elum hatchery brood stock. This likely contributes to the sharp drop in upper Yakima spring chinook redds in 1998.

Recommendation

Continue existing monitoring program.

Monitoring Item –

AQUATIC HABITAT OBJECTIVES

Are stream and habitat improvement projects meeting Aquatic habitat objectives as stated in the Forest Plan, Policy Implementation Guide (PIG), and Salmon Summit?

2002 monitoring revealed encouraging trends overall. Within each project, comparison of treatments allowed identification of more and less effective treatments that will assist future project planning.

2002 implementation and effectiveness monitoring of aquatic improvement projects included monitoring of dispersed recreation sites on Cle Elum Ranger District (Upper Yakima) and instream and upslope restoration in Little Naches watershed.

Cle Elum effectiveness monitoring of dispersed recreation sites - 2002

Restoration of dispersed recreation sites in Teanaway, Box Canyon, and Swauk watersheds on Cle Elum Ranger District revealed that controlling usage was an art. The most effective barriers provided a clear visual demarcation but not a technical challenge. Almost any structure could be removed by a determined user. However rail fences and other aesthetic structures that would not have been difficult to remove often had the longest residence times. The best strategy seemed to be to avoid technological escalation.

Except in sites with high soil moisture, plantings required lots of follow-up watering. In difficult sites, such as Teanaway site 21, survival of plantings was approximately 20%. Result: we have already enlisted campsite stewards for summer 2003 to water plantings and make user contacts.

Little Naches aquatic/riparian restoration effectiveness monitoring

The Little Naches watershed 1986-2001 was taken as a case study. Several in-stream restoration projects occurred during this time, involving placement of log and boulder structures in the channel Mark Muir Masters Thesis, University of Washington 2003: Evaluation of restoration projects and channel changes in the Little Naches basin, with a comparison to the American River basin, WA). Upslope restoration during this time period involved reduction of fine sediment delivery from roads to streams: measures included road abandonment, improving cross-drains, and ensuring ditches did not deliver to the stream system (Mark Muir Masters Thesis, University of Washington 2003: Evaluation of restoration projects and channel changes in the Little Naches basin, with a comparison to the American River basin, WA). Two extreme high flow events occurred during this time period (1990 and 1996).

Three reaches of the Little Naches River and one reach of the American River were compared. Reach 4 of Little Naches is extremely confined by the highway and by ditching/diking to protect the highway. Reach 7 of Little Naches is confined by the highway for approximately 1/3 of its length, and reach 8 of Little Naches is largely unconfined. Although no perfect "reference/unmanaged" comparison reach exists, the American River may provide a useful comparison of a similar system with fewer management impacts (Mark Muir Masters Thesis, University of Washington 2003: Evaluation of restoration projects and channel changes in the Little Naches basin, with a comparison to the American River basin, WA).

Muir found that several habitat parameters important to fisheries and aquatic health, including pool area, woody debris abundance, and spawning gravel abundance and embeddedness, improved in all three reaches of Little Naches 1986-2001. These parameters trended towards, but remained significantly different from, conditions in the American River, where channel complexity and activity were greater (more and deeper pools, more woody debris, and more side channels, greater bar re-working).

Channel morphology indicators suggested that Reaches 7 and 8 of Little Naches may be in equilibrium, while in Reach 4 channel migration occurred following high flows but the high degree of artificial confinement prevented the channel from attaining the sinuosity and other morphologic characteristics that in American River appear to be important to key processes such as pool formation, side channel formation, and to habitat complexity (Mark Muir Masters Thesis, University of Washington 2003: Evaluation of restoration projects and channel changes in the Little Naches basin, with a comparison to the American River basin, WA).

Ongoing fine sediment monitoring throughout Wenatchee National Forest in cooperation with the Yakama Nation (Yakama Nation Fisheries Fine Sediment Monitoring Report 2002, Jim Matthews) also indicates that fine sediment has declined over the last decade throughout the Little Naches River.

The findings suggests that:

Habitat conditions are improving in the Little Naches River.

Artificial channel confinement may prevent re-establishment of key processes and limit full recovery of habitat parameters.

Upslope improvements and natural flood events appeared to make a greater contribution to habitat improvement than did instream projects.

Among instream projects: boulders had greater longevity than wood; wood installed on the margins had greater longevity than channel-spanning wood structures; and instream wood was vastly more effective if it retained its root wad.

Fine sediment levels appear to be decreasing in Little Naches River.

In Rattlesnake Creek, little change occurred between two sample years (1997 and 2002).

In South Fork Tieton (Minnie Meadows area) there are only four years of data. Percent fines have increased from 10% in 1999 to 19% in 2002. This could be due to natural variability, to a pulse of sediment moving through the system from a historic event, etc. It is also possible that this indicates a fine sediment problem due to current management; however none of the Forest Service, USFWS, WDFW or Yakama Nation biologists consulted in the inter-agency monitoring meeting (June 2003) could suggest a possible management source.

Conclusions:

Due to high natural variability and long response times, this monitoring may not reveal small or recent changes in fine sediment levels.

Within the constraints of data quality, there are no indications of fine sediment increases in Wenatchee National Forest streams, except in South Fork Tieton.

High fine sediment levels occur in some systems in Swauk Sandstone geology such as Mission watershed and may be the natural condition (based on comparison to unroaded streams in Mission watershed). See Leavenworth and Lake Wenatchee Ranger District Sediment Monitoring 2002.

South Fork Tieton / Minnie Meadows data indicates a need for further monitoring to determine whether a problem exists, its nature and cause. In 2003, the Forest will continue the existing sediment sampling in South Fork Tieton, and augment it with aerial photo and ground reconnaissance to explore possible causes.

Recommendations

South Fork Tieton / Minnie Meadows data indicates a need for further monitoring to determine whether a problem exists, its nature and cause. In 2003 the existing sediment sampling in South Fork Tieton, will continue and be augmented it with aerial photo and ground reconnaissance to explore possible causes.

The Forest will add sediment monitoring in the Williams drainage to monitor effects of a 2003 culvert replacement and to establish pre-mine sediment levels for proposed mine projects.

Campsite stewards will water riparian plantings in summer 2003 as well as making user contacts. These campsites stewards have already been enlisted.

Monitoring Item –

AQUATIC ECOSYSTEMS

Is the ecological health of the aquatic ecosystems recovering or sufficiently maintained to support stable and well-distributed populations of fish species and stocks?

In some of the watersheds, aquatic and riparian health is strong. These watersheds are population anchors, or strongholds, for Management Indicator Species. The Wenatchee National Forest contains some of the best habitat remaining in the Columbia Basin for bull trout, sockeye, and upper Columbia spring chinook.

The ecological health of many of our aquatic/riparian areas is severely impaired, and not all impaired systems can be clearly shown to be recovering in all aspects of health. The large stream systems on Wenatchee National Forest may be recovering from degradation that occurred early in this century. Most of our serious habitat concerns have been inherited from 20-100 years ago. We have discontinued damaging practices in timber, grazing, mining, and roading that were once standard, and have worked to develop policies, such as the Ground Based Harvest Policy, to protect resources

On land with in the Wenatchee National Forest, aquatic ecosystems are generally recovering relative to the early 1900s (McIntosh, B.A., Sedell, J.R., Smith, J.E., Wissmar, R.C., Clarke, S.E., Reeves, G.H., and Brown, L.A. 1994b. Historical changes in fish habitat for select river basins of eastern Oregon and Washington. Northwest Science Vol. 68, Special Issue:36-53). In some cases recovery can also be documented over the last few decades (Mark Muir Masters Thesis, University of Washington 2003: Evaluation of restoration projects and channel changes in the Little Naches basin, with a comparison to the American River basin, WA, Yakama Nation Fisheries Fine Sediment Monitoring Report 2002, Jim Matthews).

Aquatic ecosystems should be considered on a whole watershed basis. The Wenatchee National Forest is coordinating with multi-agency watershed teams to manage, protect and restore aquatic habitat. For more information, see Upper Columbia Salmon Recovery Board "Biological Strategy to Protect and Restore Salmonid Habitat in the Upper Columbia Region."

Recommendations

Continue existing monitoring program.

K. RANGE MANAGEMENT – Item not addressed this year.

L. ROAD MANAGEMENT

Monitoring Item-

ROAD CONSTRUCTION/RECONTRUCTION

The goal is to ensure that the transportation system is being constructed and reconstructed to serve the planned resource management objectives at the assumed annual rates.

Roads are to be designed as safe and durable structures suitable for their intended uses. Within the Riparian-Aquatic Habitat Protection Zone, there are 11 Management Practices intended to minimize the number of roads and their impacts. The "Threshold of Variability

"for the road miles is 25 percent of the annual *Forest Plan* projections and 10 percent for the decade. Additional Standards and Guidelines are contained in the *Northwest Forest Plan*.

Unit of Measure	*Forest Plan* Decade Average	FY 2002 Actual
Forest Road Program Construction Miles	2	0.2
Reconstruction Miles	16	4.3
Timber Purchaser Construction Miles	80	1.7
Reconstruction Miles	3	1.8

The *Northwest Forest Plan* requires monitoring of several items; 1) net increase of roads in Key Watersheds, and 2) new roads in Roadless Areas. There was no net increase of roads in key watersheds and no new roads were built in Roadless Areas.

The estimated average annual output for arterial and collector road construction and reconstruction under the Forest Road Program is 18 miles per year. The actual accomplishment for FY 2002 was 4.5 miles. This is outside of the 25 percent annual "Threshold of Variability". The original estimates were based upon the amount of historical funding available for this purpose.

Timber Purchaser: The estimated average annual output for Timber Purchaser Road Construction is 83 miles. The actual accomplishment for FY 2002 was 1.7 miles. The amount of road construction and reconstruction by Timber Purchasers is entirely dependent upon the amount and location of the timber contracted for harvesting. The assumption that this system will be completed in the first 18 years of the Plan is not valid.

Recommendations:

Monitoring indicates management direction is not being achieved according to the original projections in the *Forest Plan*. Revise estimates during *Forest Plan* revision. Continue monitoring as scheduled.

Monitoring Item-

ROAD MAINTENANCE

The goal is to ensure that the transportation system is being maintained to the appropriate standard to serve the planned resource management objectives.

Unit of Measure	*Forest Plan* Decade Average	FY 2002 Actual
Roads Maintained for: Passenger Cars Miles & High Clearance Vehicles Miles	4233	3814

The Wenatchee National Forest continues to experience the effects of the loss of maintenance performed and/or paid for by Timber Purchasers. In the past, the timber sale program has accounted for approximately 1 to 1.5 million dollars of maintenance annually. If appropriated road maintenance funds are not increased, there could be a significant reduction in the amount of roads available to the public as well as a reduction in the level of

comfort and ease of access. This year, 74 percent of the roads were not maintained to full road management objectives.

Recommendations:

Continue Roads Analysis as outlined in the new Road Management Policy to determine the appropriate size and makeup of our existing road transportation system.

Reduce maintenance levels and decommission those roads no longer necessary where appropriate.

Continue monitoring as scheduled.

Monitoring Item-

ROADS CLOSED/OBLITERATED

The goal is to determine how much of the transportation system is no longer needed for management activities. Short and long-term needs are to be considered. Roads can be closed and placed in Maintenance Level 1 or obliterated (decommissioned) and removed from the transportation system inventory.

The *Forest Plan* Standards state that unless a resource need is documented in a project analysis, roads currently open will remain open and newly constructed roads will be closed to public vehicle access.

Unit of Measure	*Forest Plan* Decade Average	FY 2002 Actual
Roads Closed Total System Miles	1703	1812
Roads Obliterated Miles	NA	3.7

The Wenatchee National Forest is continuing a comprehensive process of Access and Travel Management, and this year will continue a Roads Analysis process that is likely to identify additional roads to close or obliterate/decommission.

Recommendations

Further evaluation; additional yearly information is needed. Due to the uncertainty about the future, it would be premature to make new assumptions for the purposes of estimating outputs until the Forest Plan is revised.

M. INSECT AND DISEASE

Monitoring Item-

INSECT AND DISEASE CONTROL

The goal is to assure that management practices do not contribute to increases in the incidence of destructive insects and diseases, such as western spruce budworm, tussock moth, pine beetles, dwarf mistletoes, root rots, and others. The monitoring question is:

Are destructive insect and disease organisms remaining below potentially damaging levels following management activities?

A survey was conducted during the summer of 2002 by the Forest Health Protection (FHP) staff of the Pacific Northwest Region, in cooperation with the Washington Department of Natural Resources. Copies of the survey maps were given to the Wenatchee National Forests and each ranger district.

The survey was conducted from airplanes, and represents current insect conditions across the forested landscapes of the Wenatchee National Forest. The aerial survey, supplemented with other observations, indicates that insect and disease levels changed in 2002 from 2001.

Defoliation caused by the western spruce budworm was mapped on 51,500 acres on the Naches Ranger District. The area defoliated decreased 82,500 acres from 2001. About 1,100 acres experienced light defoliation by blackheaded budworm in the vicinity of the Leavenworth-Cle Elum District boundary near Mission Ridge Ski Area. The budworm populations will be monitored and there are no plans to do any suppression action in 2003.

No defoliation attributable to Douglas-fir tussock moth was observed in 2002.

Bark beetle activity increased in 2002 compared to 2001. Observed acres of mountain pine beetle affected lodgepole pine stands remained high in 2002. Fir engraver/ western balsam bark beetle activity was recorded on 30,000 acres on both the Okanogan and Wenatchee National Forests as compared to 17,000 acres in 2001. Acreage with recorded Douglas-fir beetle caused mortality decreased from 24,000 in 2001 to 15,000 in 2002. Droughty conditions contributed to the increase in acres affected by bark beetles.

As part of the monitoring efforts, the Wenatchee National Forests has a "Strategy For Management of Dry Forest Vegetation". One of the management objectives for protecting, maintaining, or enhancing forest health on dry forests is to reduce susceptibility to insects and disease occurrence outside of endemic levels.

Options for achieving management objectives related to insect and disease are to thin to reduce adjacency of potential brood trees, to reduce spread potential of disease, to increase tree resistenece to insect and disease and to favor insect-disease resistant tree species.

Recommendations

Incorporate options for achieving management objectives as identified in the "Strategy for Management of Dry Forest Vegetation on the Wenatchee National Forest".

Fiscal Year 2001 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

N. FOREST FIRE PROTECTION

Monitoring Item –

FOREST FIRE PROTECTION

The goal is to provide protection from wildland fires for Wenatchee National Forest users, facilities, and resources in an efficient manner. The monitoring questions are:

Do implemented fire suppression strategies adequately protect the public, facilities and forest resources?

Are costs of protection in line with those projected by the National Fire Management Analysis System?

The Forest experienced a total of 116 starts, 97% of the average of 120. However, the number of acres burned, was above average, burning 40,200 acres in 2002. Lightning accounted for 46 fire starts and the remaining 70 fire starts were human caused. Wenatchee National Forest employees supported fire suppression efforts in Region 6 as well as other regions in the national forest system, with the first assignment occurring in April. Additionally, forest personnel supported prescribed burning fuel treatment operations in Regions 3 and 8.

The first statistical fire of the season occurred on June 10th. There were two large fires on the Forest, both on the Chelan Ranger District. The Deer Point Fire began on July 15, 2002 and was 37,657 acres; the Tunnel Fire began on July 19, 2002 and was 165 acres. Only the Deer Point Fire required an Incident Management Team, utilizing Type 1, 2, and 3 teams.

Emphasis was placed on developing and maintaining interagency programs to improve the efficiency of the Fire Management Program. The Forest continued to participate in the Central Washington Interagency Communication Center (CWICC), to staff fire suppression crews and engines, to participate in the Eastern Washington Wildland Fire Coordinating Group, and to develop Incident Management Teams in partnership with the State of Washington Department of Natural Resources and other federal agencies.

The Wenatchee National Forest hosted national and regional fire suppression resources. These included a National Interagency Hotshot Crew stationed on the Entiat Ranger District. The Wenatchee National Forest also hosted national, regional, and forest helicopter programs. These were a National Type II Helicopter for large incident support, a Regional Rappel Crew with Type III Helicopter and also a Forest Type III Helicopter. All helicopter aircraft and crews were based at Pangborn Airport. The Moses Lake Air Tanker Base facility was operational for its first full year but the air tankers spent significant time at other bases, due to large fire activity elsewhere. Also, the assigned C-130 was grounded, after another C-130 crashed in mid-June in California.

In FY 2002, the Forest emphasized safety both in training and daily work activities. Managers organized for the fire season by providing advanced training and encouraging employees to participate on Type I and Type II Incident Management Teams. All employees available for fire suppression attended a firefighter safety refresher, including a practice shelter deployment, and were work capacity fitness-tested. New employees attended Interagency Firefighter Training at Entiat High School in Entiat. The Fire Staff emphasized safety to all initial attack personnel at the annual fire preparedness reviews.

In concert with the fire suppression program, the Forest continued to emphasize fire detection and prevention as important components of the Fire Management Program. During a period of very high fire danger from July through September, most of the Wenatchee

National Forest was closed to campfire use. Districts provided extra fire prevention personnel to make field contacts. At the same time, additional fire severity suppression personnel were stationed on the forest.

Recommendations

Continue to monitor the effectiveness of the fire protection and prevention programs.

Fiscal Year 2001 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item –

USE OF PRESCRIBED FIRE

The goal is to provide appropriate, efficient application of prescribed fire in support of the Forest management program. The monitoring questions are:

Are the acres being treated with prescribed fire meeting expected resource management objectives?

Are forest fuel loadings exceeding natural levels and therefore placing forest users, improvements and/or resource values at risk?

The use of fire as a tool to manage unwanted vegetation and debris, to prepare areas for tree planting, and to improve wildlife habitat continued to be a significant portion of the fire program. During FY 2002, 5,070 acres were treated with prescribed fire.

The Wenatchee National Forest continued to develop and implement the *Dry Site Strategy*, which allows managers to implement fuel reduction and vegetation management activities on a large acreage scale that will decrease the possibility of high intensity fires.

The Forest successfully implemented prescribed burns that met resource management objectives and reduced fuel loadings. However, today's increased awareness about fuel loadings and stand densities in excess of historic conditions, in the dry forest ecosystem has caused the Forest to look for new management techniques that can be applied on a much larger scale than used in the past.

The Wildland Fire Use Plans for all districts were approved by the Regional Forester for implementation within wilderness areas. Approval for implementation of the plan outside of wilderness areas is pending upon the resolution of survey and manage issues by the Regional Ecosystems Office (REO). Three wildland fires for resource benefit were implemented in 2002, burning 20, .01, and .01 acres each.

Recommendations

Continue to support on-going research supporting fire as an important disturbance process in all dry site ecosystems.

Manage wildland fires within designated wildernesses for resource benefit.

Fiscal Year 2001 Recommendations

Last year's recommendation was to support on-going research supporting fires as and important disturbance process in all dry site ecosystems. Monitoring of this research has continued.

O. AIR QUALITY

Monitoring Item-

LONG-TERM TRENDS IN AIR QUALITY

The goal is to evaluate the long-term air quality of major air sheds, including the long-term air quality of Class 1 Areas within the Wenatchee National Forest where smoke can accumulate due to air stagnation. The monitoring question is:

Do fuel management prescribe burns on the Wenatchee National Forest contribute significantly to smoke levels in major airsheds of the forest area?

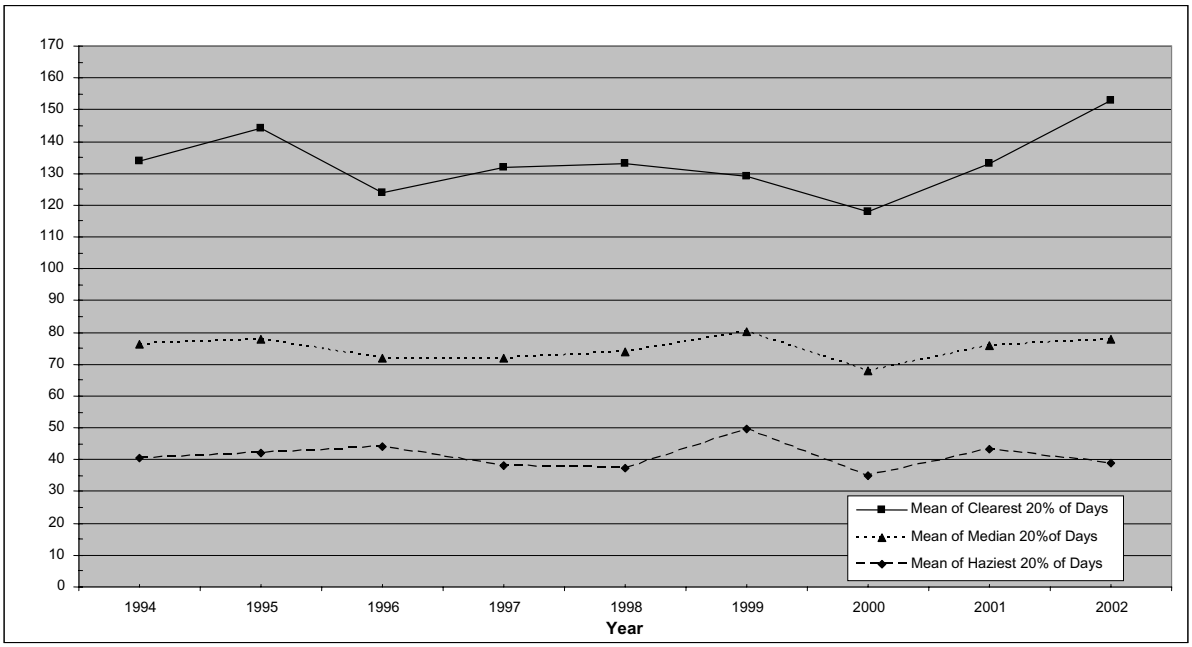
Is visibility in Class I wilderness areas maintained at a high level of quality.

Smoke monitors are operated on a yearlong basis at three locations: Chelan, Leavenworth and Wenatchee. These sites are operated by the Wenatchee National Forest in cooperation with the State of Washington Department of Ecology, and are part of a statewide network of air quality instruments. Data from these sites are posted hourly on the DOE web-site and can be accessed at: http://airr.ecy.wa.gov/Site/reports/report.html.

The effort since initiation of sampling at five sites within the Wenatchee National Forest in the fall of 2002 has been to train operators and establish a data record that meets quality control standards of the DOE and EPA. That objective has been accomplished. Now the process used by the State Department of Natural Resources to review and authorize requested prescribe projects on the Forests can utilize local air quality data in the review process. The intent is to avoid air stagnation periods or periods when there are high levels of background smoke, while utilizing periods of high air quality to accomplish prescribed burning.

Class 1 Areas are wilderness areas formally designated by the Clean Air Act as Class 1 air quality areas. On the Wenatchee National Forest these areas include: Glacier Peak, Goat Rocks, Mt. Adams, and Alpine Lakes wilderness Areas. Instruments located within the Wenatchee National Forest monitor the latter two. Data for the Alpine Lakes has been collected since 1994. The chart below shows trends in visibility for the Alpine Lakes Wilderness Area. The unit of measure is miles of visual range.

Alpine Lakes Visibility 1994-2002 as Monitored from Snoqualmie Pass



Recommendations

Operate instruments on a yearlong basis. Efforts are ongoing to evaluate data and make comparisons to air quality standards.

Continue to use data from these monitoring sites as the Forest Service evaluates any new permits for emission sources that could potentially affect Class 1 wilderness areas.

P. MINERALS

Monitoring Item -

MINE SITE RECLAMATION

The goal is to ensure that disturbed lands are reclaimed to a use consistent with the rehabilitation Standards and Guidelines.

This report includes large and small historic mine sites under the Comprehensive Environmental Recovery, Compensation and Liability Act (CERCLA) and the non-CERCLA Abandoned Mine Land (AML) program. It also includes reclamation associated with small scale mining activities such as one to three person underground mining and it includes drill, backhoe and underground mineral exploration and small tonnage sand & gravel, pit run, and building stone removals (mineral material permits and contracts). Also included are recreational-level prospecting including panning, metal detecting, rocker box operations, and 2 to 5 inch suction dredge operations. As was the case in preceding years, during FY 2002, there were no moderate or large scale exploration or mining activities on the Forest, and there were no leasable energy or non-energy related mineral activities.

Monitoring of CERCLA and historic AML sites and current operations during FY 2002 indicates that approximately 200 acres were in a disturbed status from mining-related activities on the Wenatchee National Forest. Most of the disturbed acres (approximately 120 acres) involve the historic Holden Mine Site. The Holden Mine is under a CERCLA remediation study. Actual on-the-ground remediation is estimated to be two or more years away.

Additional acres of disturbance involve historic AML sites across the Forest. As inventories are completed and funding is made available, many of these sites will be evaluated for restoration. An estimated 50 acres of disturbance were the result of recent small-scale mining operations that were approved over the recent past and continue. A small portion of these disturbed acres represents new disturbances. A small portion was satisfactorily reclaimed and met reclamation objectives. Many of the sites were not reclaimed because the operations were ongoing. Several operators have been instructed through Notices of Noncompliance to bring their operations into compliance with regulations and/or their operation plans.

Due to the lack of funding and staffing, many of the very small-scale prospecting and mining activities such as recreational mining or building stone collection were not monitored. Experience has shown that reclamation for the majority of these activities is not necessary due to the very small impacts associated with them. Of those monitored, probably about 90 percent either did not require reclamation because the activity was 1) inside an established borrow pit, or 2) stone was picked along drainage ditches or 3) cut slopes, and reclamation was not appropriate, or 4) reclamation efforts were appropriate and successful. Most of the remaining ten percent have not been reclaimed because the operation is continuing.

There were 12 ongoing mining operations where the Forest Service maintained a reclamation bond. They represent surface disturbing operations of such an extent that reclamation would be required. All bonded Plan of Operation-level mining activities were monitored and appropriately administered. Where appropriate, reclamation bonds may be used to fund reclamation.

The objectives in the *Forest Plan* appear to be adequate, and reclamation bonds and regulatory authority provide for compliance when the objectives are not achieved.

Recommendations

The major problem with appropriate monitoring is not the process, but the available funding and staff. Continue to request funding that would allow 100 percent monitoring of all bonded mineral related activities, as has been the case over the last several years.

If additional funding is provided, conduct additional monitoring to ensure adequate reclamation is being completed on non-bonded operations. Where it is not being properly completed, take regulatory action to require the operator to do the required reclamation.

Fiscal Year 2001 Recommendations

Last year's recommendations were essentially the same as this year's recommendations; monitoring continued.

Monitoring Item -

MINE OPERATING PLANS

The goal is to ensure that mining notices of intent to operate and plans of operations are processed in a timely manner and administered to standard, complying with regulation, Forest Management Goals, and Forest Plan Standards and Guidelines.

Notices of intent are generally processed within the fifteen-day time frame established in regulations (36 CFR 228, subpart A). Notices are processed by evaluating the described work and either returning a letter to the proponent that acknowledges the notice as sufficient, or, if the authorized officer determines that surface impacts may be significant, a letter is sent requiring that a plan of operations be submitted. Plans of operations are often not processed within the thirty-plus-sixty day time frame that is established in Forest Service mining

regulations. The primary reason is the time necessary for the Forest Service to compliance with Federal environmental laws and their implementing regulations.

Additionally, the Forest provided approximately 52 mineral materials contracts (sand and gravel, pit run, building stone, landscape rock, etc) to the public in accordance with regulations at 36 CFR 228, subpart C. These sales are for one to several tons of material at a cost that is usually less than $50.00 per contract. The highest price contract in 2002 was $110.00. Materials are removed from specified existing material sources and sometimes from along forest road cuts. These are short term operations.

Approximately 75 Notices of Intent, Plans of Operations, and mineral material sales were processed in FY 2002, with a total of about 150 active plans or notices (many were multi-year activities). Of these, about 40 percent of the total operations were administered (monitored) to standard. However, all of the bonded operations (12) were administered to standard. The operations that were not administered were anticipated to have such small impacts that monitoring was considered not necessary. Most of these very small activities are recreational in nature and occur briefly and/or are conducted over the weekends.

Recommendations

The objectives and the Standards and Guidelines in the Forest Plan appear adequate, but the level of funding is inadequate to ensure total compliance. If determined to be desirable, request adequate funding that will allow monitoring of all mineral related activities.

Based upon the administration and monitoring completed, a Forest Plan adjustment is not necessary at this time.

Actively conduct programmatic resource surveys that will accommodate anticipated mineral activities. This will allow the processing of Plans of Operation in a more timely and efficient manner.

Fiscal Year 2001 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Q. COMMUNITY EFFECTS AND RESOURCE BUDGETS

This item was dropped as recommended in the FY 2001 Monitoring Report.

R. GENERAL MONITORING of STANDARDS AND GUIDELINES

Monitoring Item-

GENERAL STANDARDS AND GUIDELINES

The goal is to ensure implementation and validation of *Forest Plan* Standards and Guidelines including those in the *Northwest Forest Plan*. Monitoring seeks to assure Wenatchee National Forest goals, outputs, and the desired future condition. The monitoring questions are:

Are Forest Plan Standards and Guidelines being implemented?

Are implemented Standards and Guidelines achieving the expected results?

Proposed projects are reviewed for consistency with *Forest Plan* Standards and Guidelines during the National Environmental Policy Act process. After the signing of the *Northwest Forest Plan*, training sessions were held to ensure that Wenatchee National Forest employees understood the rationale and Standards and Guidelines within the *Northwest Forest Plan*. These training sessions and reviews are done on a continuing basis.

The *Northwest Forest Plan* established an interagency monitoring program on implementation monitoring. The procedures were developed in Fiscal Year 1995. In 1996 and 1997, the Forest led an interagency team comprised of various members of the Provincial Advisory Committee in conducting monitoring of how management activities such as timber sales, roads, and restoration projects complied with the Standards and Guidelines contained in the *Northwest Forest Plan Record of Decision*. This monitoring program on the Forest documented a high level of project-level compliance. This interagency monitoring program was expanded in 1998 to include "watershed-level" monitoring as well as "project-level" monitoring. Watershed-level monitoring is an important step beyond project-level assessments. Monitoring at this landscape scale:

Helps fulfill the legal commitment to monitor at all scales.

Allows management activities (projects) to be assessed in regard to achieving *Northwest Forest Plan* goals.

Provides a more balanced view of the Forest's compliance by complementing project-level reviews with an assessment of more pro-active *Northwest Forest Plan* requirements associated with the management of "areas" such as Key Watersheds and Late-successional Reserves. Typically, requirements associated with landscapes at the watershed scale address planning, prioritizing, and integration of activities.

The 2002 Monitoring of both the Eastern Washington and Yakama focused on density management projects within Late Sucessional Reserves.

Review findings from Yakima Province - Nile Timber Sale and prescribed Fire

Information from the Watershed Assessment and Late-sucessional Reserve Assessment (LSRA) was appropreately utilized to determine adequate levels of woody debris and snags to be retained.

Riparian buffers were appropriately applied despite the difficulty when applying these standards to riparian areas associated with very dry forest plant communities.

Treatment crteria identified in the LSRA was applied and resulted in spacing and underburning prescriptions that met identified objectives.

In considering that this was the Naches District's first conscience effort at implementing the *Dry Forest Management Strategy* under the *Northwest Forest Plan*, participants felt that a very conservative approach was taken and that in the future a more aggressive approach would be warrented, particularly as applied to the project purpose and need and the scale and intensity of thinning treatments.

Review findings from Eastern WashingtonCascade Province – Icicle Campground Tree Project

It was determined that this project was inappropriately selected for review under the topic of density management in a LSR. The project entailed hazard tree recuction in seven campgrounds, only one of which was in an Late-suscessional Reserve. However, the project under review generated some fruitful discussion on area's capability of meeting Standards and Guidelines in an area were public safety is the primary issue. It also served as an opportunity to display the extra effort put forward by the Leavenworth District to work with public interst groups to resolve issues collaboratively.

A great deal of discussion focused on the challenge of re-engaging the interest of the PAC members. It was generally thought that in the PAC members were able to select a pool of projects that was of local monitoring interest and if the subsequent random selection was made from this indentfied pool, it would generate greater interest.

Recommendations

Support the regional interagency effort in developing effectiveness monitoring protocols that will lead to answering the question; are implemented Standards and Guidelines achieving the expected results?

Consider restructuring the methodology of selecting project to monitor.

S. LANDS

SUMMARY OF LANDS ACTIVITY - FY 2002

The Wenatchee National Forest has an active lands adjustment program. Land purchases in the past year have resulted in significant acreage additions to the Forest. These lands generally are assigned to the *Forest Plan* allocation hat is held by the surrounding lands. During the next round of *Forest Plan* revision, these lands will be reevaluated as to their final *Forest Plan* allocation.

Land Exchanges;

Several land exchanges were evaluated over the year including three small exchanges with individuals and two very large exchanges involving multiple partners and possible special legislation. Land exchanges often take several years to complete

Purchases:

Plum Creek Option, WEN #260A; The Wenatchee National Forest purchased 3,914.43 acres in the Snoqualmie Pass area for $3,932,855.00.

Coles Corner, WEN #262, The Wenatchee National Forest purchased 32.72 acres along the Nason River for $129,000.

Several other parcels were prepared for purchase in 2003.

Disposals:

Several Small Tract Cases to resolve long-term encroachments were worked on. Accomplishment of these will be reported in future years.

Totals:

The net increase to the Wenatchee National Forest in FY 2002 is 3,947.15 acres

IV. FOREST PLAN UPDATE

WENATCHEE FOREST PLAN AMENDMENTS from 2001

AMENDMENT	DATE	LOCATION	DESCRIPTION
Amendment 1	10/90	Forest-wide	Amendment by Secretary of Agriculture vacating ROD for Northwest Regional Guide Supplement, and returning Spotted Owl Habitat Areas (SOHAs) to the land classification of the adjacent land
Amendment 2	03/92	Forest-wide	ROD signed by Regional Forester (Region 6) for FEIS on Management of the Northern Spotted Owl in the National Forests, which directed each National Forest to insure that all management activities are consistent with the management directions adopted by the ROD.
Amendment 3	05/92	Forest-wide	General corrections and definitions made or added to the 1990 Forest Plan
Amendment 4	06/92	Sec 16 T.22N, R.11E.	Site-specific amendment for reallocation of 300 acres in the Snoqualmie Pass (Ski Acres) area from ST-1 Scenic Travel, Retention, to RE-1 Developed Recreation. This amendment was later rescinded.
Amendment 5	07/92	Sec 20 & 21 T. 28N, R. 21E.	Site-specific amendment to modify the VQO on 5 acres in the RE-3 allocation from Retention to Modification, and to allow harvest and disposal of trees for the purpose of constructing a flood control debris channel on Slide Ridge.
Amendment 5	10/92	Forest-wide	[Note: there was a duplication of amendment numbers.] Adjustments to the Activity Schedules provided in the 1990 Forest Plan.
Amendment 6	07/95	T.27N, R.19-21E. Multiple Sections	Site-specific amendment to assign allocations to lands within the Bear-Potato Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 7	07/95	Sec 27 & 35 T.25N, R.17E.	Site-specific amendment to assign allocations to lands within the Freund Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 8	07/95	Section 27 T.24N, R.17E.	Site-specific amendment to assign allocations to lands within the Boundary Butte Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 9	09/95	T.24-25N., R.17E. Multiple Sections	Site-specific amendment to assign allocations to lands within the Tumwater Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 10	10/95	T.24N, R.16-17E. Multiple Sections	Site-specific amendment to assign allocations to lands within the Eightmile Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 11	02/96	Section 16 T.26-27N., R.19E.	Site-specific amendment to assign allocations to lands within the Tyee Ridge Wildfire Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 12	04/96	T.25N., R.20E. Multiple Sections	Site-specific amendment to assign allocations to lands within the Roaring-Mills project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.

AMENDMENT	DATE	LOCATION	DESCRIPTION
Amendment 13	04/96	T.24-25N. R.19-20E. Multiple Sections	Authorization of grazing on a temporary pasture outside an existing livestock allotment.
Amendment 14	02/97	T.27N., R.18-19E. Multiple Sections	Site-specific amendment to assign allocations to lands within the Mad-Hornet Wildlife Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 15	01/98	Eldorado Creek, portions of North Fork Teanaway River watershed, and portion of upper Beverly Creek, Cle Elum RD, Kittitas Co.	Change Eldorado Creek RNA from a candidate RNA to an established RNA.
Amendment 16	06/97	Fish Lake Bog, Lake Wenatchee RD, Chelan Co.	Establishment of Fish Lake Bog RNA
Amendment 17	11/97	Snoqualmie Pass AMA (I-90 Corridor)	Establishment of standards and guidelines and management direction for the Snoqualmie Pass AMA as directed by the Northwest Forest Plan amendment
Amendment 18	09/98	Section 22 T.22N., R.19E.	Site-specific amendment to assign an allocation to a parcel of land within the Sand Ecosystem Restoration project area acquired by the Forest Service since publication of the Forest Plan. The parcel was allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 19	09/98	Section 12, T.21N., R.13E. Section 36, T.22N., R.11E. Section 8, T.19N., R.13E.	Site-specific amendment to allow for wetland crossings by access road segments to private inholdings where no other options exist.
Amendment 20	09/99	Section 22, T.27N., R.17E.	Site-specific amendment to adjust allocation line between Matrix allocation and SI-2 allocation to coincide with natural topographic features, forest stand habitat conditions, and an existing county road.
Amendment 21	07/99	T.18-20N. R.12-15E. Multiple	Forest Plan amendment to assign allocations to lands acquired from Plum Creek Timber Company as part of the legislated I-90 Land Exchange.
Amendment 22	04/94	Forest-wide	Northwest Forest Plan Amendment of the Wenatchee National Forest Plan.
Amendment 23	01/01	Region-wide	"Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guideline" in documents within the range of the northern spotted owl.

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